PALEOLIMNOLOGICAL ASSESSMENT OF THE EFFECTIVENESS OF A CONSTRUCTED SEDIMENTATION BASIN AT REDUCING SEDIMENT AND NUTRIENT LOADING TO SKINNER LAKE, INDIANA

BY

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EXECUTIVE SUMMARY

A paleolimnological approach was taken to evaluate the effectiveness of the Rimmel sedimentation basin at trapping inorganic sediment and total phosphorus prior to entry into Skinner Lake, Indiana. Five lake cores representing a transect of increasing distance into the lake from the Rimmel Ditch were dated with ^{210}Pb and annual accumulation rates for inorganic and organic sediment as well as total phosphorus were calculated for the past 100 years. A sediment core was also taken in the wetland proper but was not able to be dated isotopically. The results of this study suggest that the Rimmel sedimentation basin was ineffective at trapping either sediments or phosphorus, and accumulation rates of both parameters actually increased following construction of the sedimentation basin.

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INTRODUCTION

Study Site

Skinner Lake, Noble County, Indiana (Figure 1) is a 49.4 ha basin with mean and maximum water depths of 9.8 and 4.3 meters, respectively. In order to assist draining of wetland areas south of the lake for agricultural purposes, the lake was lowered by approximately 5 feet (1.5 m) in 1883 (Pearson 1987). A concrete sill dam was installed at the outlet in 1962 and was replaced by a sheet metal dam in 1984 following dam washout in 1982. The State of Indiana calculted a BonHomme trophic state index for the lake during the mid 1970's of 45, assigning the lake to the category of worst water quality (Class Three) (IDEM 1986).

The Skinner Lake watershed is approximately 3,649 ha (McNabb et al. 1983), yielding a watershed to lake ratio of 73.8. Approximately 68% of the watershed area is devoted to agriculture. Although five stream/drainage systems discharge into Skinner Lake (Figure 2), 82% of the watershed area drains through the Melvin-Rimmell system (McNabb et al. 1982). The latter drainage system contributes approximately 79% of the watershed water discharge to the lake (Pearson 1987).

Watershed Management Practices

Recognizing that the extremely large watershed to lake area ratio (73.8) was likely a major contributing factor to the poor water quality of Skinner Lake, $1,006,501 was allocated by EPA under Section 104 of the Clean Water Act for implementation of a series of watershed management practices to reduce sediment and nutrient loading to the lake (Pearson 1987). Practices implemented in sensitive areas of the watershed, especially in the Rimmel drainage system, between 1979 and 1982 included conservation tillage, terraces, livestock exclusion and waste systems, structural diversions, grade stabilization, vegetation stabilization of waterways, and construction of sedimentation basins (McNabb et al. 1983, Pearson 1987). During the early 1980's, it was estimated that the combined sediment savings from such practices amounted to approximately 17,015 tons annually (Pearson 1987).

A keystone element in the watershed management scheme was a 20,205 m^2 sedimentation basin on the Rimmel drainage system approximately 246 m upstream from the discharge point into Skinner Lake (Figure 3). It was hoped that the effectiveness of the basin as a sediment and nutrient trap would be enhanced as emergent vegetation would quickly colonize the area. The Rimmel sedimentation basin was

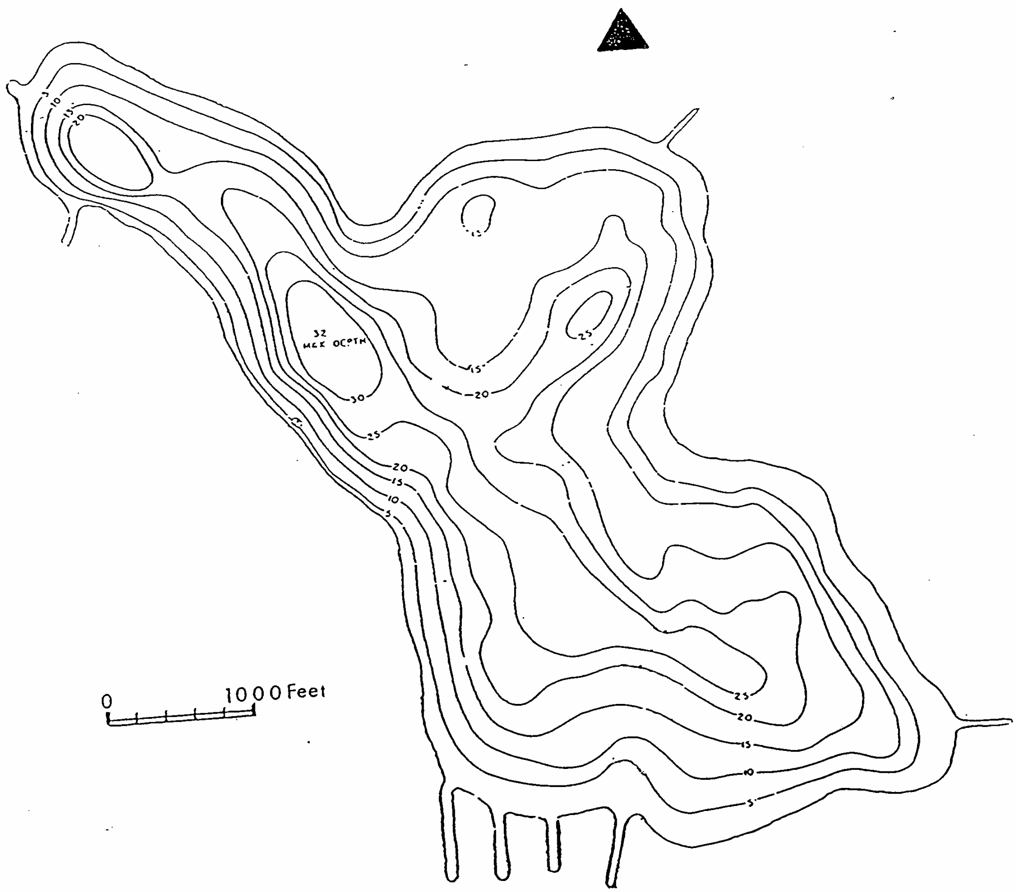


Figure 1. 1956 Bathymetric Map of Skinner Lake, Indiana.
Contour Intervals are in Feet.

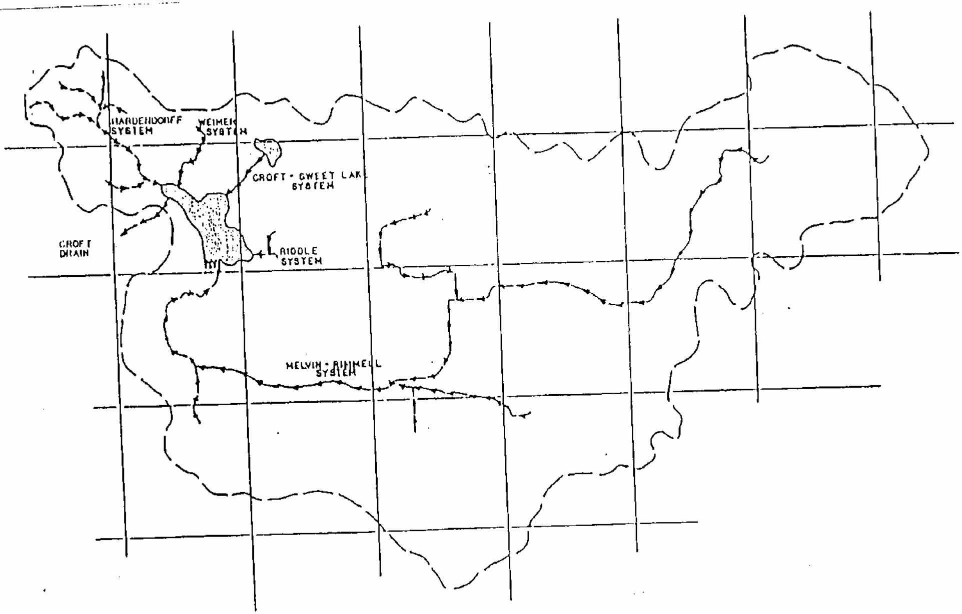


Figure 2. Skinner Lake, Indiana Watershed. From McNabb et al. (1982).

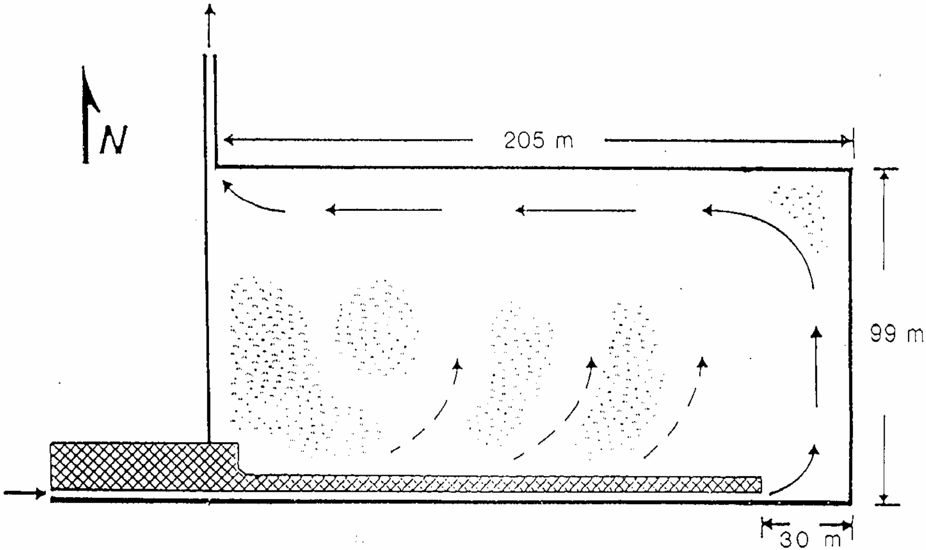


Figure 3. Rimmel Sedimentation Basin/Wetland. From McNabb et al. (1982).

designed such that during low flow periods incoming water would be channeled along the southern border of the basin by a levee to the southeast corner of the basin where it would be allowed to flow across the sedimentation basin to the discharge point at the northeast corner (NcNabb et al. 1982). It was suggested that the effectiveness of the basin was reduced under low flow conditions as water was limited to a 46 m wide channel in contact with only 11,845 m^2 of the sedimentation basin area (McNabb et al. 1982). Under high flow conditions, the basin was designed such that incoming water was allowed to sheet flow over the length of the levee, thus spreading out over the entire 20,205 m^2 of the basin before exiting to Skinner Lake.

Based on a comparison of pre (1979) and post (1981-1982) survey data, it was concluded that the Rimmel sedimentation basin was reducing the sediment and total phosphorus levels of Rimmel Ditch water by 18% and 10%, respectively, before water entered Skinner Lake (McNabb et al. 1982). Given that Rimmel Ditch contributes approximately 79% of total watershed discharge to the lake, the sedimentation basin was estimated to have reduced total sediment and phosphorus loading to Skinner Lake by 14% and 8%, respectively. Between 1979 and 1982, observed total phosphorus concentrations in the lake dropped from 15 mg/m^3 to 10 mg/m^3, while chlorophyll dropped from 63 mg/m^3 to 54 mg/m^3 (McNabb et al. 1983).

Although the trophic state of Skinner Lake appeared to have been reduced as a result of the installation of the Rimmel sedimentation basin, it appeared that this was not accompanied by a reduction in the amount of suspended inorganics in the water column of the lake (McNabb et al. 1982, Pearson 1987). McNabb et al. (1982) suggested that the size of the Rimmel sedimentation basin (20,205 m^2) was less than half of the theoretical basin size needed (53,333 m^2) to reduce 100% of suspended clay under base flow conditions. They also noted that although particulate phosphorus concentrations were often reduced as water passed through the sedimentation basin, the concentration of dissolved phosphorus in the exiting water was actually elevated. McNabb et al. (1982) suggested from 1981 data that the extensive tile fields installed as part of the watershed management scheme increased loadings of total nitrogen and phosphorus to the lake associated with increased water discharge and stream bank erosion. Contradicting data in 1982, however, led them to conclude that the faster delivery of water via tile-drains did not counter the success of the soil conserving land management practices in reducing nutrient loading.

Even with serious questions being raised immediately following implementation, there has been a paucity of follow-up studies to evaluate the effectiveness of the watershed management program of 1979-1982 in general, and that of the Rimmel sedimentation basin in particular. By 1990, the projected pathway of incoming water (Figure 3) under low flow conditions had been scoured out as a deep channel from the southeastern to northeastern corner of the sedimentation basin. Although extensively covered with emergent herbaceous and woody vegetation throughout, casual observation suggested that water rarely overflowed the channel banks to sheet flow across the basin.

The purpose of the present study was to provide a historical perspective on loading rates of both sediment and phosphorus to Skinner Lake as a means of assessing the relative effectiveness of the Rimmel sedimentation basin on both parameters. A paleolimnological approach has been taken whereby annual accumulation rates for sediment organic and inorganic matter and total phosphorus have been calculated for a series of 210-Pb dated sediment cores taken both from the Rimmel sedimentation basin and along a transect perpendicular to the inlet of the Rimmel drainage system into Skinner Lake.

METHODS

Core Collection

A modified Livingstone piston coring device (Livingstone 1955) equipped with a clear 4.1 cm ID cellulose buterate tube was used to collect sediment cores from the center of the Rimmel sedimentation basin (27 December 1989) (Figure 4) and at five locations in Skinner Lake arranged along a transect from the inlet of the Rimmel drainage system (15 June 1990) (Figure 5). The coring technique permitted examination of each core to insure that the sediment-water interface was not disturbed during the coring operation. All cores were extruded within two hours of collection and sectioned at 1 cm intervals with each sample being placed in a plastic bag for storage. All samples were then kept at 4^{o} C until analyzed.

Sediment Parameters and Total Phosphorus

One cm^3 sediment samples from select core levels were placed in small procelain crucibles of known dry weight, and wet weight of the sediment was measured using a Mettler analytical balance. Water loss (% water) was calculated after reweighing the samples following dessication for 24 hours at 100^{o} C. Inorganic and organic fractions were determined by weight loss following ignition at 550^{o} C for one hour. Samples were allowed to cool to room temperature

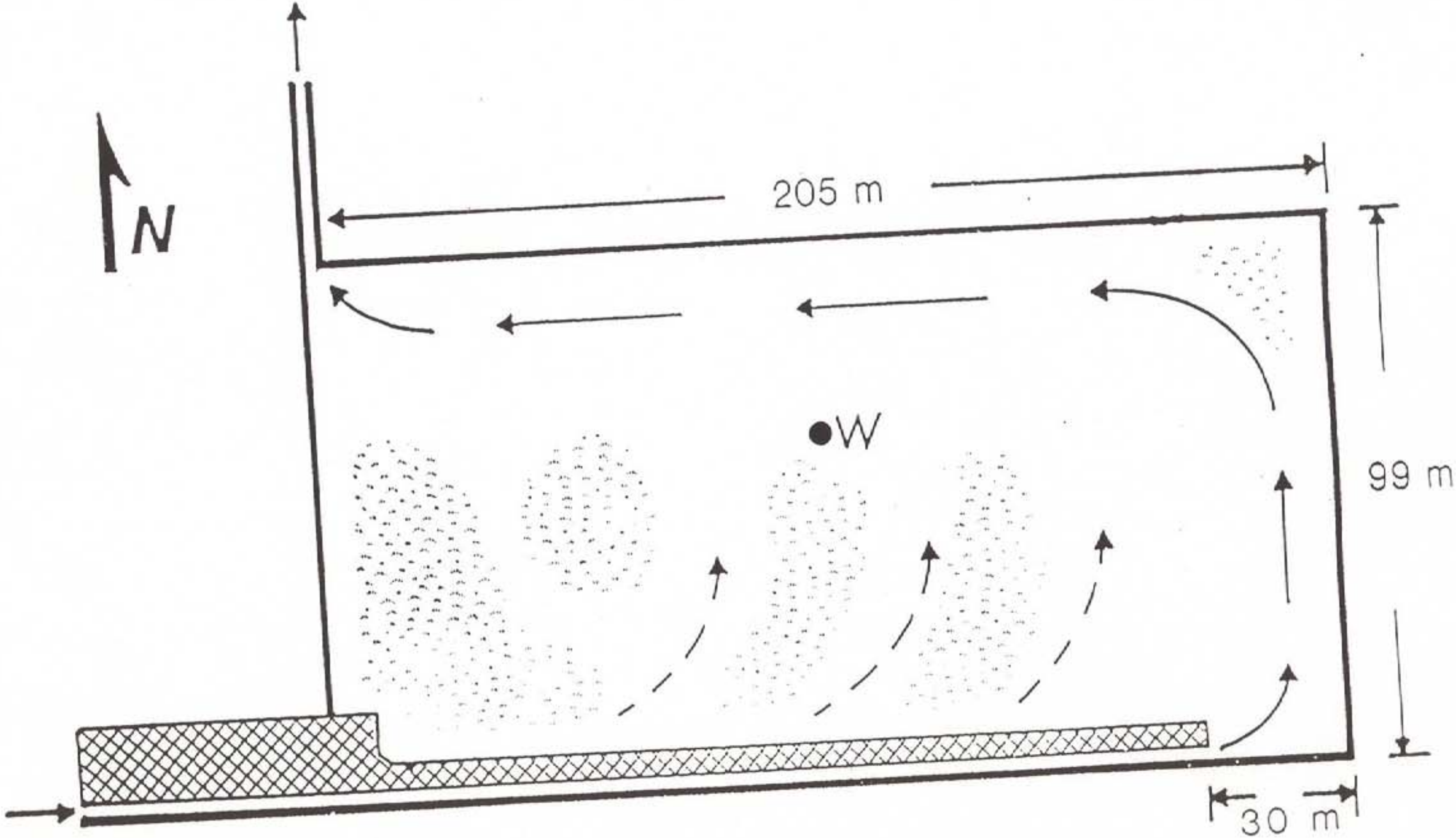


Figure 4. Coring Site (W) in the Rimmel Sedimentation Basin/Wetland.

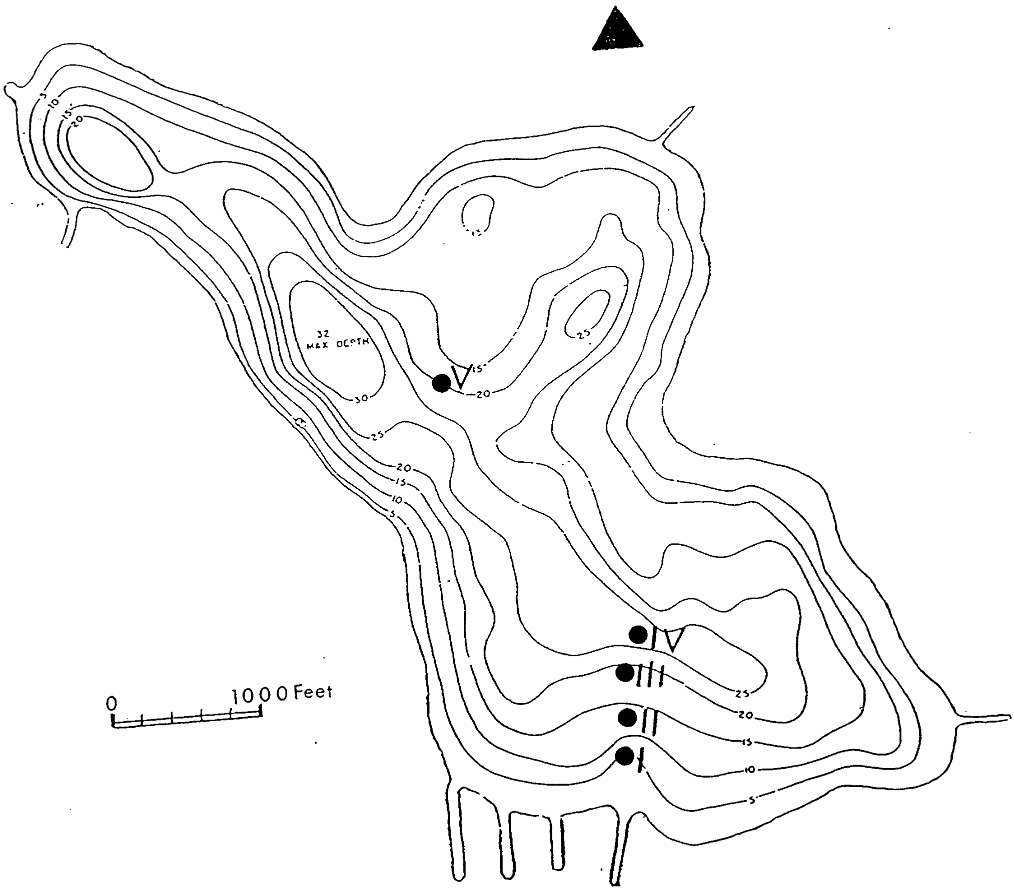


Figure 5. Coring Sites in Skinner Lake Indiana.

in a dessicator before weighing.

Determination of total phosphorus for select core levels utilized the ignition of Anderson (1976). Inorganic residue from the loss on ignition analysis just described was washed into a 200 mL beaker using 25 mL of 1N HCl and boiled for 15 minutes on a hot plate. Each sample was then diluted to 100 mL, and orthophosphate was measured by the ascorbic acid method (APHA 1985) using a Bausch and Lomb spectrophotometer equipped with a 1 cm light path. For the latter analyses, reagent blanks were run after every five sediment samples.

Lead-210 Dating of Sediments

Each of the sediment cores were dated utilizing state of the art ^{210}Pb methodology. ^{210}Pb concentrations were measured by direct gamma assay using a coaxial N-type, intrinsic-germanium detector (Princeton Gamma Tech). This type of detector counts over a large range of gamma energies and can be used for simultaneous measurement of supported and unsupported ^{210}Pb or other gamma-emitting radioisotopes of environmental interest (Appleby et al. 1986, Nagy 1988. An outer shield (0.95 cm steel), main shield (10.1 cm lead), and an inner lining (0.05 cm cadmium + 0.15 cm copper) were used to reduce background radiation at the germanium detector.

Samples for isotope analysis were dried at 100^{o} C for 24 hours, pulverized by mortar and pestle, weighed, and placed in small plastic petri dishes (#1006, Falcon, CA). Core sections were combined (up to 4 cm) to obtain an adequate sample weight (generally > 3 grams). Petri dishes were sealed with plastic cement and left for 14 days to equilibrate radon (^{222}Rn) with radium (^{226}Ra). Counting times varied from 14 to 45 hours depending on sample weight; small samples needed to be counted longer to minimize uncertainty. Blanks were counted for every two samples to determine background radiation. Standards were run with the same frequency to track efficiency (counts/gamma) and calculate a ^{226}Ra conversion factor (pCi/cps).

Sample spectra were analyzed for activity in the 46.5 keV for ^{210}Pb, and activities at 295 keV (^{214}Po), 352 keV (^{214}Pb) and 609 keV (^{214}Bi) representing uranium series peaks were used to compute supported levels of ^{210}Pb. Calculation of ^{210}Pb dates followed the constant rate of supply model (Appleby and Oldfield 1978), which is able to quantify changing sedimentation rates.

RESULTS AND DISCUSSION

Sediment Dating and Accumulation Rates

Spreadsheets with ^{210}Pb levels and associated calculations, core profiles of unsupported ^{210}Pb, and an age versus core depth curve are provided in the Appendices for each of the six cores analyzed as part of this project. Cores from the Rimmel wetland and nearshore lake stations I and II appeared to be extremely disturbed as a result of recent high sedimentation rates of inorganic sediment. It is likely that dredging activities in this area during the 1960's, 1976 and 1982 destroyed the top part of the sediment profile. Examination of the wetland core in the field demonstrated that the upper 14 cm of the core was highly inorganic and overlaid organic sediments typical of Indiana wetlands. It is presumed that the upper 14 cm of sediment represents accumulation since the construction of the Rimmel sedimentation basin, while sediments below were deposited in the preexisting wetland at the site.

From field observation it appeared that the upper 23 and 45 cm of the cores from lake sites I and II, respectively, were extremely inorganic and overlaid organic sediments containing fragments of macrophytes that are considered typical of littoral zones. The contention of recent (last decade) rapid sedimentation of inorganic sediments in nearshore areas of Skinner Lake near the Rimmel inlet is supported by extremely low ^{210}Pb values that appeared during the core dating in the upper 23 and 45 cm segments of cores I and II indicating dilution of atmospheric ^{210}Pb via a rapid rate of sedimentation.

Plausible dated profiles have been constructed for the three disturbed sites both utilizing profiles of ^{210}Pb from the three undisturbed sites (III, IV, V) as well as the ^{210}Pb dilution technique of Binford and Brenner (1986) for surface sediments. Binford and Brenner (1986) showed that fall-out ^{210}Pb levels can be used as a dilution tracer to calculate dry matter accumulation rates provided both the activity of ^{210}Pb in the sediment sample and the flux of fall-out ^{210}Pb are known. The former was measured here, while flux can be estimated readily when total residual unsupported ^{210}Pb content and the ^{210}Pb radioactive decay constant are known. ^{210}Pb residuals were measured in undisturbed Skinner Lake cores and compared with literature values for the region (Robbins and Edgington 1975).

Recent (last 5-10) dry sediment accumulation rates were calculated for the uppermost sediments (2-3 cm) of each lake core by the method just described and yielded the following results:

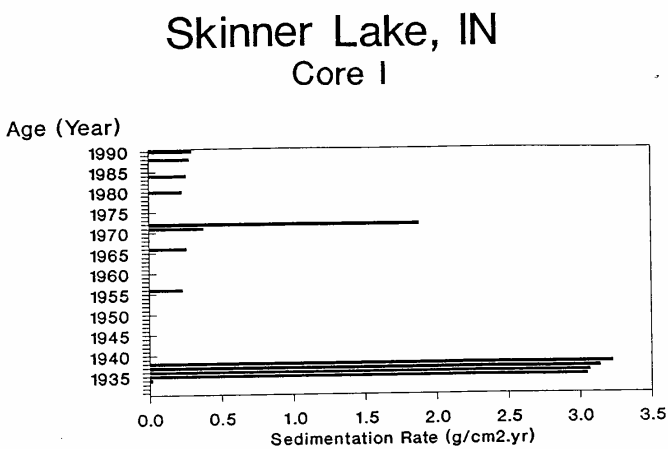
Core	$g/cm^2/yr$
I	1.10
II	0.78
III	0.31
IV	0.34
V	0.33

As stated earlier, field observations suggested that 23 cm and 45 cm of sediment have been deposited at sites I and II, respectively, possibly within the past two decades. Further confirmation of this is provided from the dry sediment accumulation rates of surface sediments, which are 3.3 and 2.3 times greater (see table above) than reported from sites farther offshore. The apparent disagreement in the rank ordering of sites I and II for surface sedimentation rates between this technique and the more detailed technique provided in Figure 6 is explained by the fact that the dilution technique is less precise that the detailed core analyses provided in Figure 6. It is obvious that the Rimmel Ditch is forming a sediment delta that extends at least 140 meters into Skinner Lake. Unfortunately, the present study can not separate the contribution from watershed erosion versus that from channel scouring through the Rimmel sedimentation basin. Field observations suggested that the Rimmel Ditch has scoured a channel at least two-three meters deep through the sedimentation basin.

Although not readily apparent for core I, the dry sediment accumulation rate profile for core II clearly shows that sedimentation rates began to increase sharply beginning in the mid 1980's to reach maximum core values during 1989 and 1990 (Figure 6). This period of increased sedimentation was only poorly represented in core III and totally absent from cores IV and V. Sedimentation rates at the latter two core sites actually decreased after 1980. Finally, with the exception of core I, sedimentation rates appeared to increase sharply during the 1930's at all core sites and remained at high levels to the present. It is possible that the difference at core I is related to dredging activities during the 1960's, 1976, and 1982.

Sediment Water Content

Sediment water content for the top 13 cm of the wetland ranged from 30-35%, but remained at 40-80% below 14 cm (Figure 7). As will be supported later by the profile of inorganic matter, the upper 14 cm of highly inorganic, compact sediments were likely deposited after creation of the Rimmel sedimention basin and overlie preexisting wetland sediments of 40-80% water.



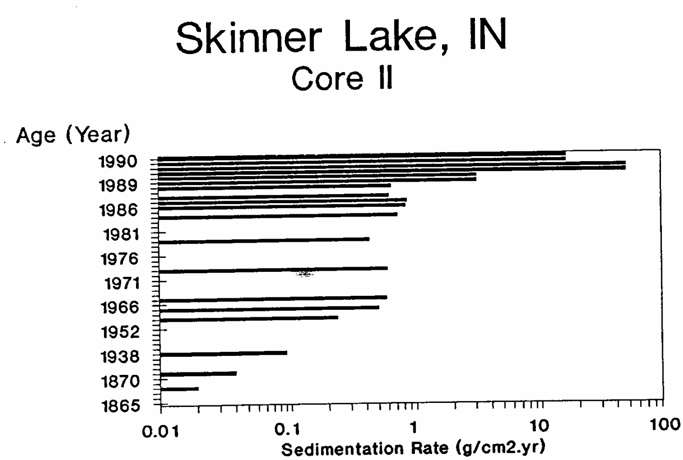
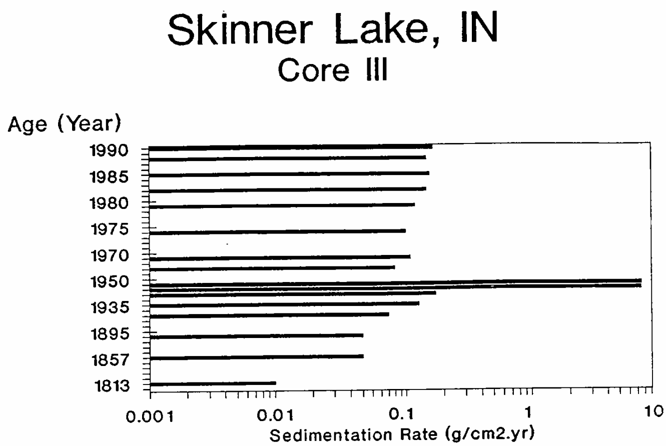
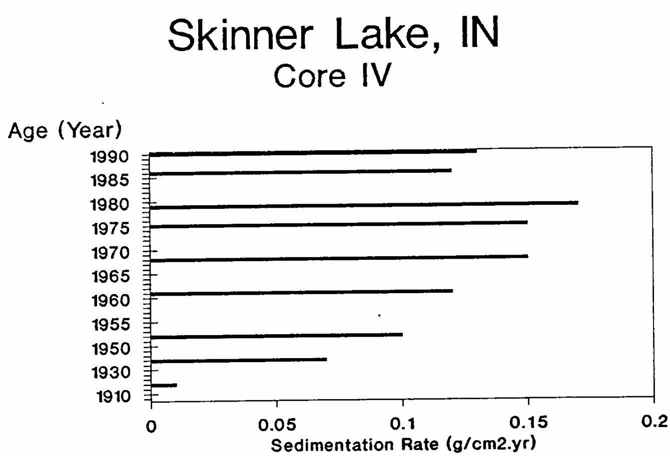


Figure 6. Dry Sediment Accumulation Rates in Skinner Lake, Indiana.





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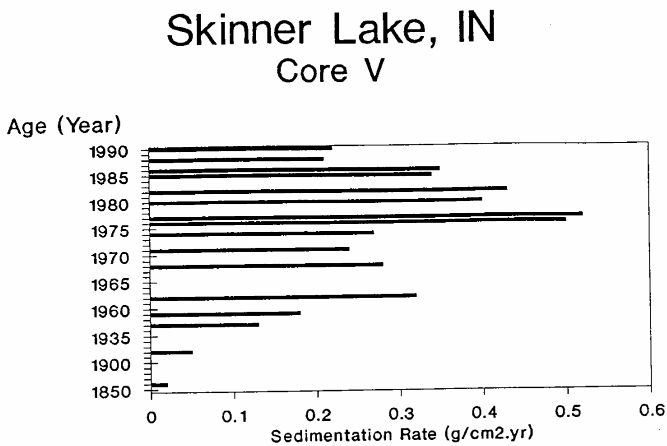

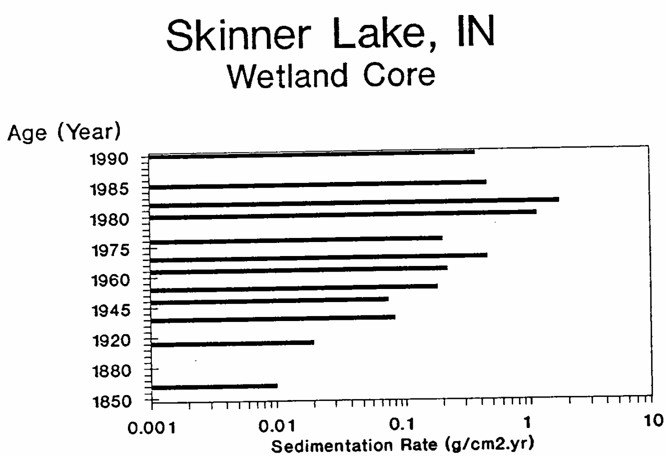

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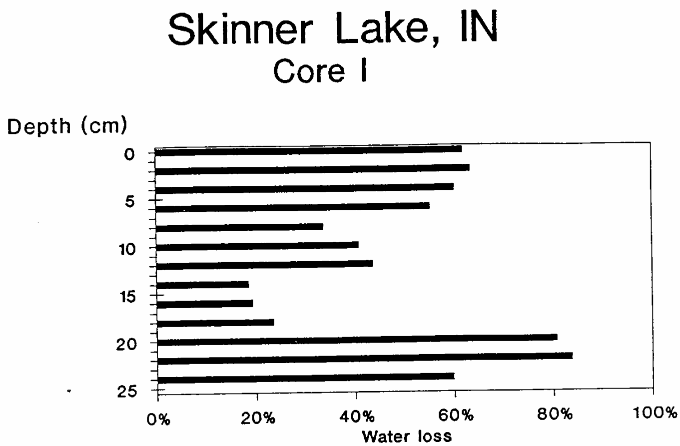


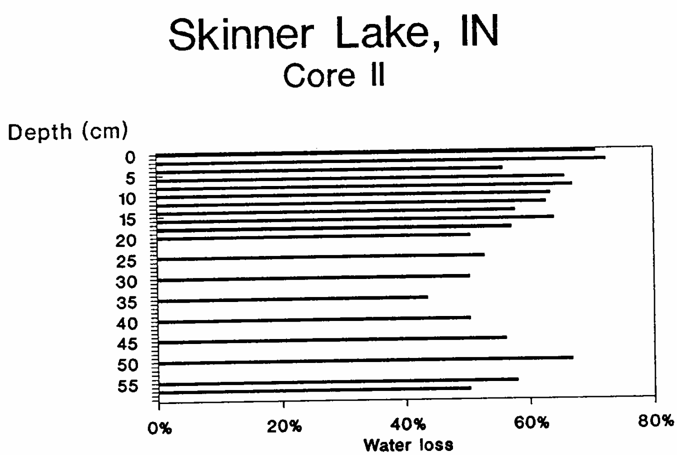
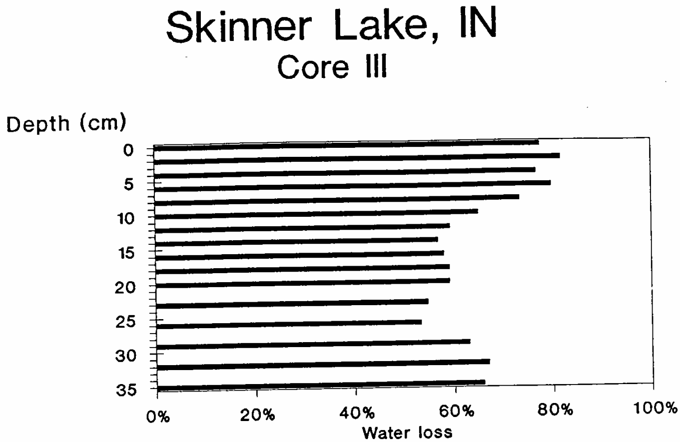
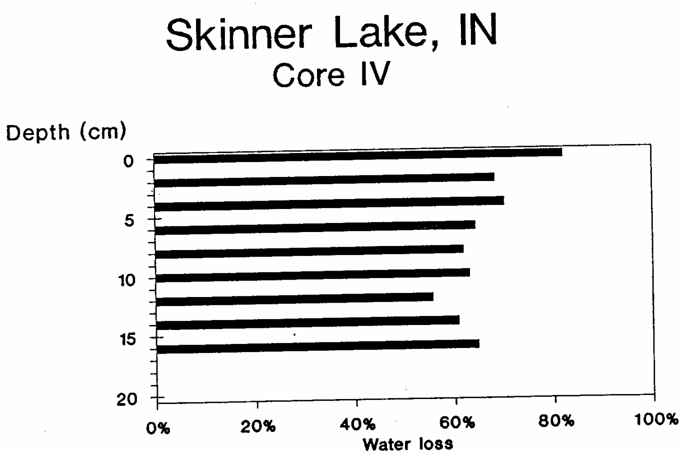


Figure 7. Water Content of Sediment Cores.





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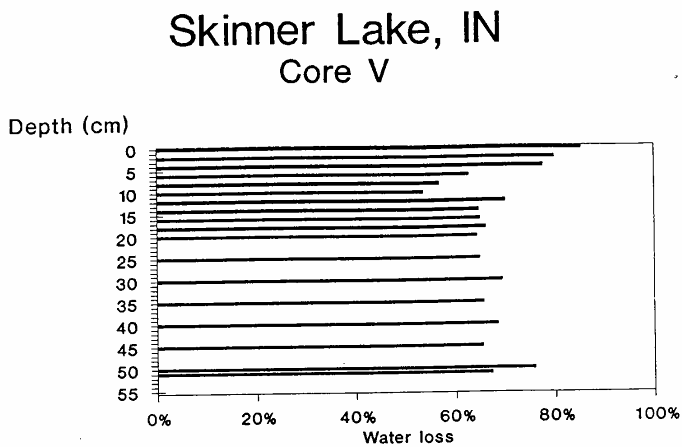


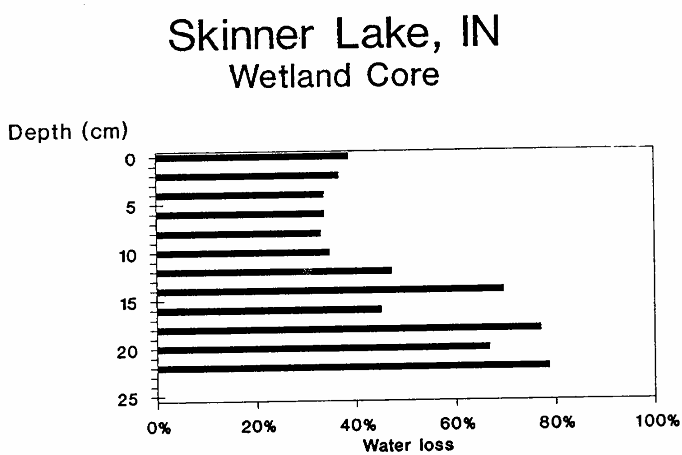


Figure 7. Continued.

A similar interpretation is offered for cores I and II where water content is typical of lake sediments (>60%) below 20 and 50 cm, respectively, drops sharply immediately above these core levels, then gradually increases toward the surface of the core (Figure 7). As suggested earlier, the upper 23 and 45 cm of sediment in these cores represent the recent formation of an inorganic sediment delta at the mouth of the Rimmel Ditch inlet associated with a change in watershed erosion and/or channel scouring through the Rimmel sedimentation basin. Cores III-V remained >50% water throughout their lengths with sediment flocculence increasing progressively from 10 cm to the surface.

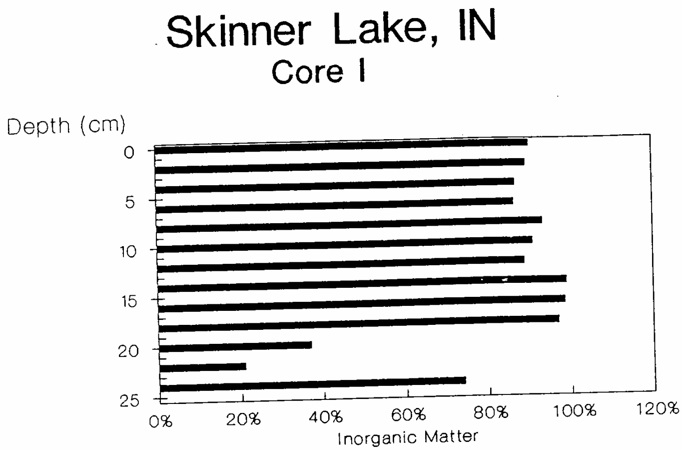
Sediment Inorganic and Organic Content

With the exception of the Rimmel wetland and site I cores, the percentage of total sediment dry weight consisting of inorganic matter remained relatively constant throughout the depth profiles of all cores and ranged from 82-95% (Figure 8). The upper 13 and 17 cm, respectively, of the former two cores displayed enrichment of inorganic over organic matter. It appears that although the rate of dry sediment accumulation may have fluctuated during the past century at lake sites II-V, the balance between organic and inorganic matter was little affected.

Profiles for accumulation rates of inorganic matter are the mirror image of those described earlier for total dry sediment accumulation (Figure 9). While inorganic accumulation rates increased in the Rimmel sedimentation basin and at lake site II near the mouth of the Rimmel Ditch inlet to Skinner Lake since construction of the Rimmel sedimentation basin, those of the most distant sites from the inlet (IV and V) actually declined during the same period.

With the exception of the Rimmel sedimentation basin and lake site I, the percentage of organic matter throughout the core profiles of all cores remained at less than 25% (Figure 10). The high organic content in the deepest sections of the former two cores suggests the presence of extensive macrophyte communities at these locations prior to the recent episode of increased inorganic sediment deposition. All lake cores did, however, display increased percentage contribution of organic matter to total dry sediment in the most recently deposited sediments that may be indicative of advancing cultural eutrophication in the lake.

The accumulation rate of organic matter in all lake cores increased sharply during the 1930's coincident with increased deposition of inorganic matter described earlier (Figure 11). Accumulation rates at lake sites II and III



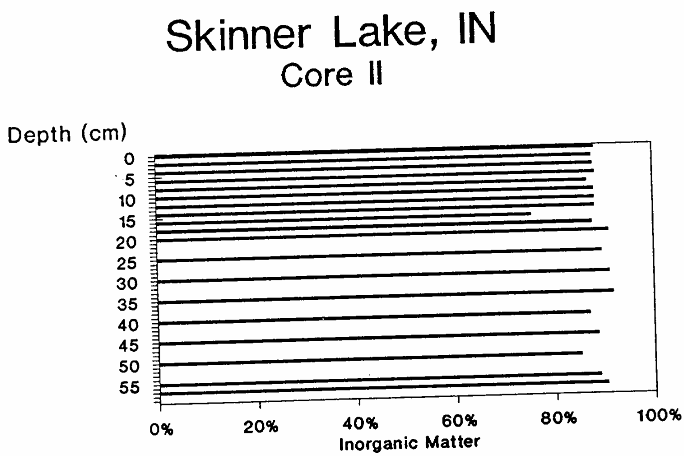
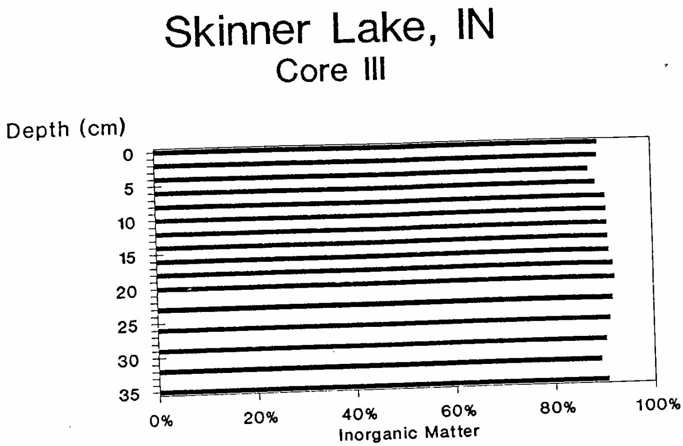
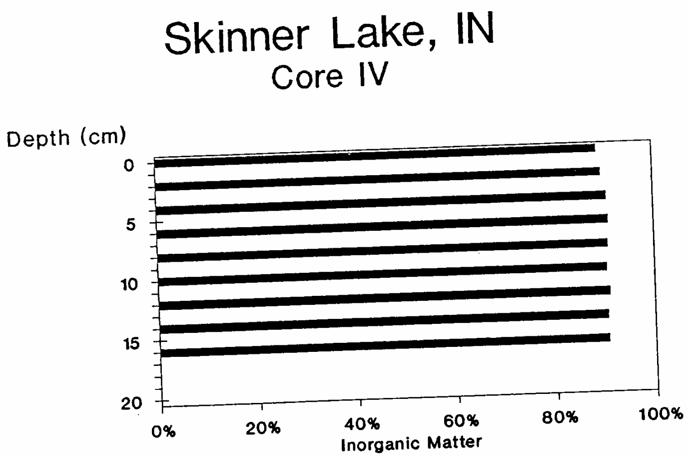


Figure 8. Percent Inorganic Matter Content of Sediment Cores.





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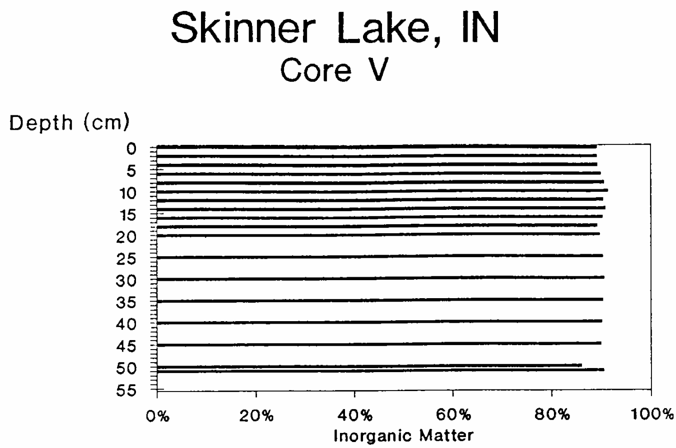

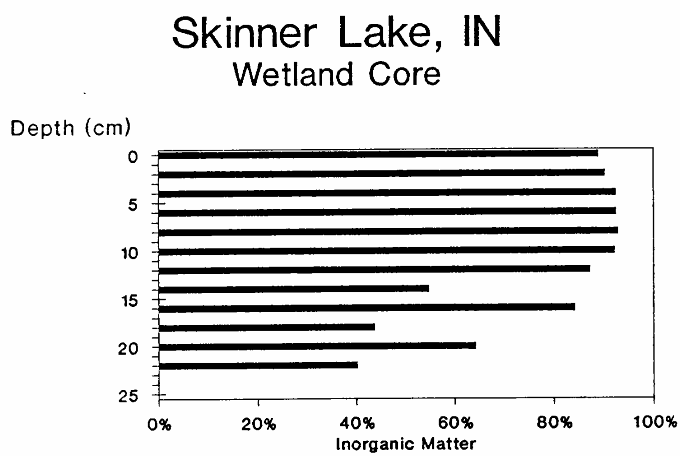

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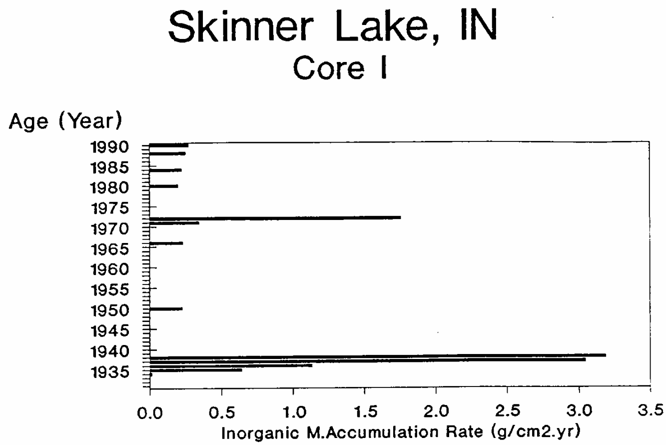


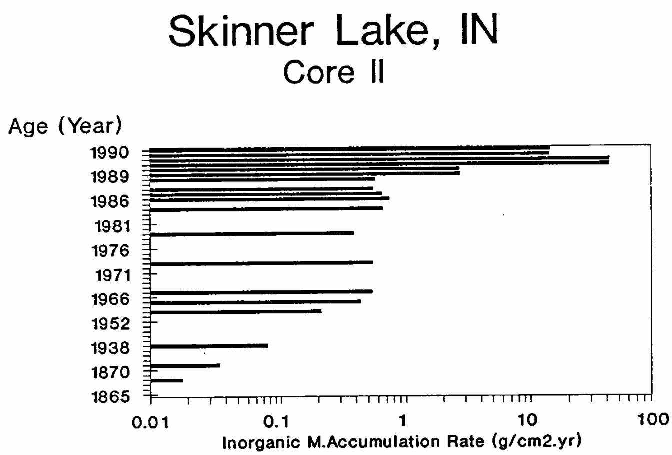
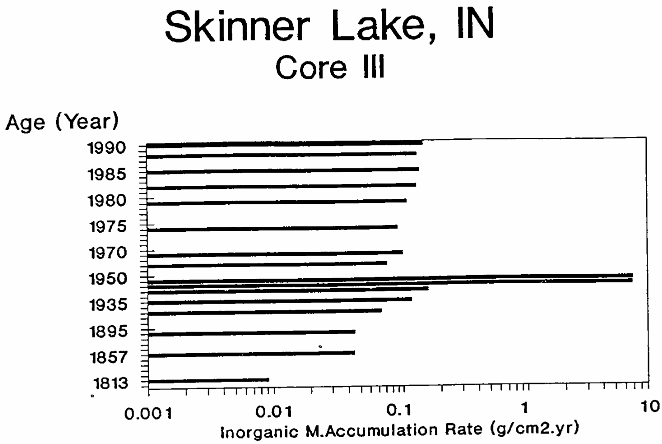
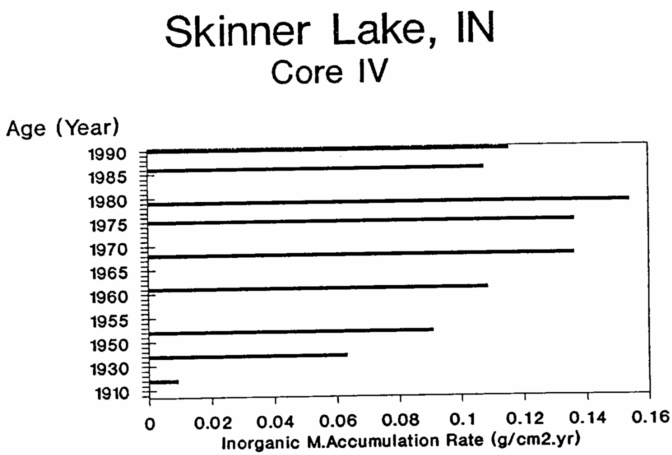


Figure 9. Accumulation Rates of Inorganic Matter in Sediment Cores.





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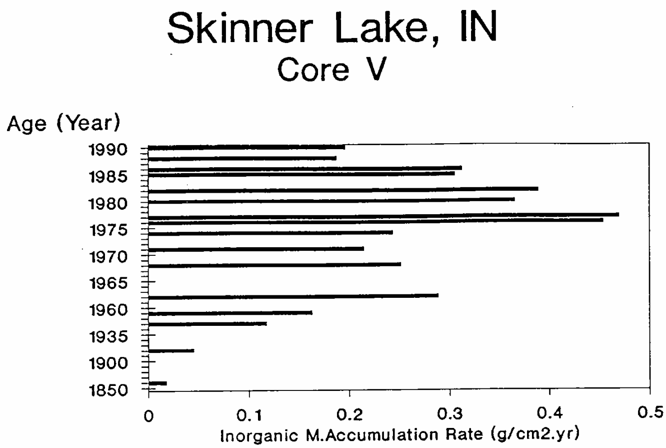

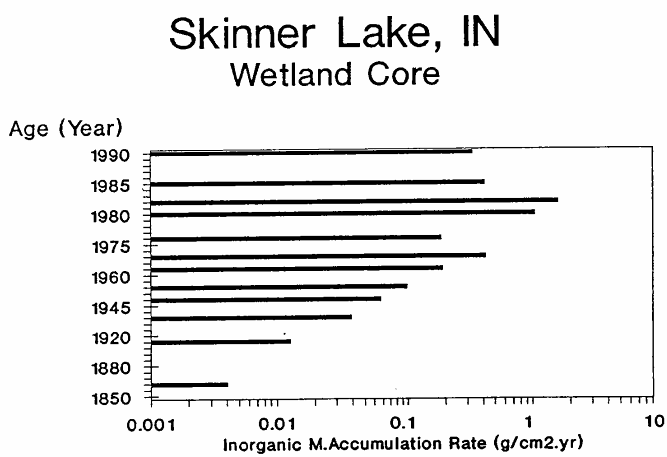

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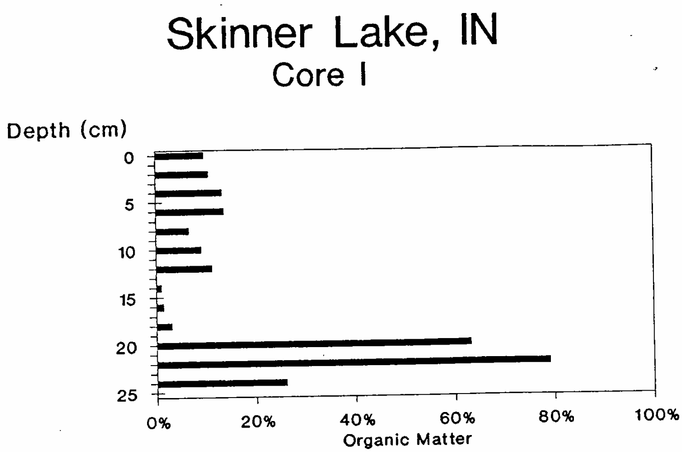


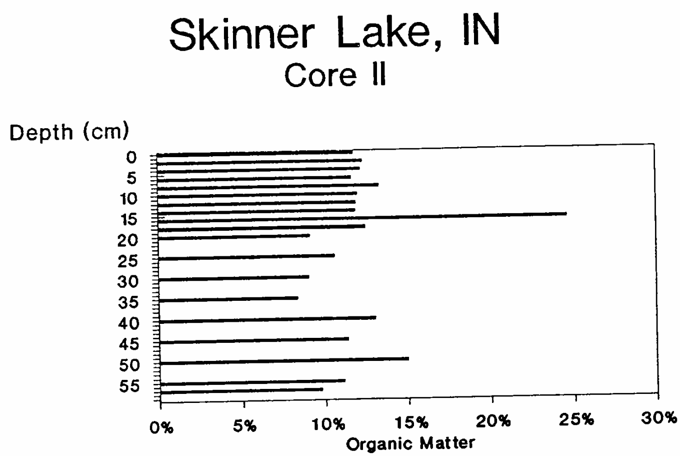
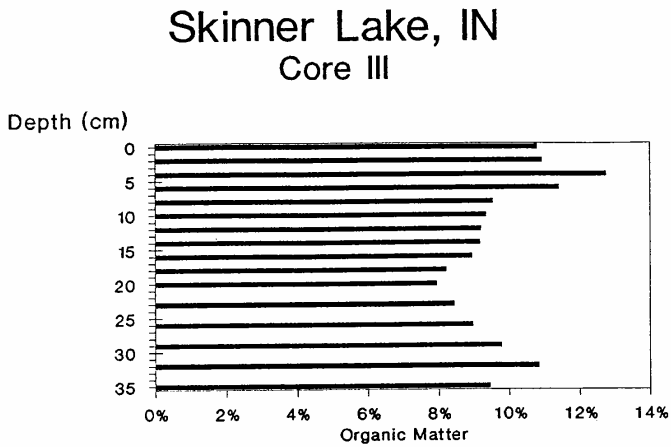
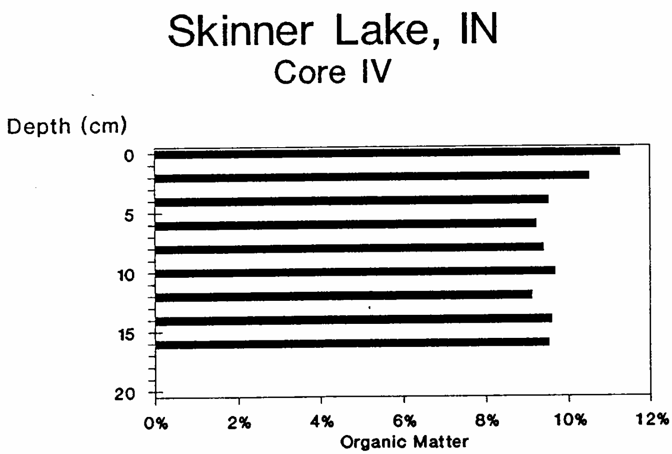


Figure 10. Percent Organic Matter Content of Sediment Cores.





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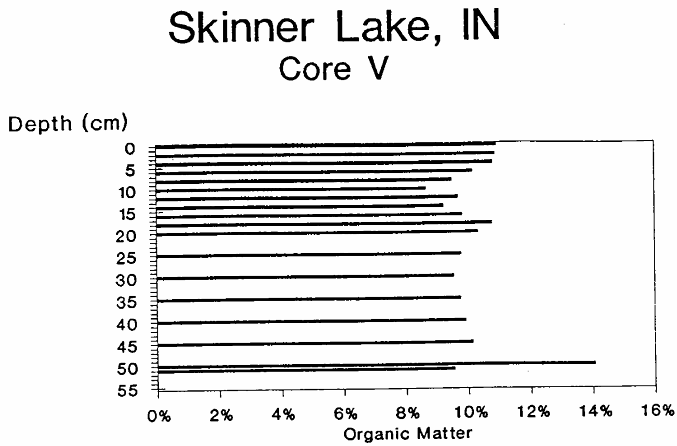

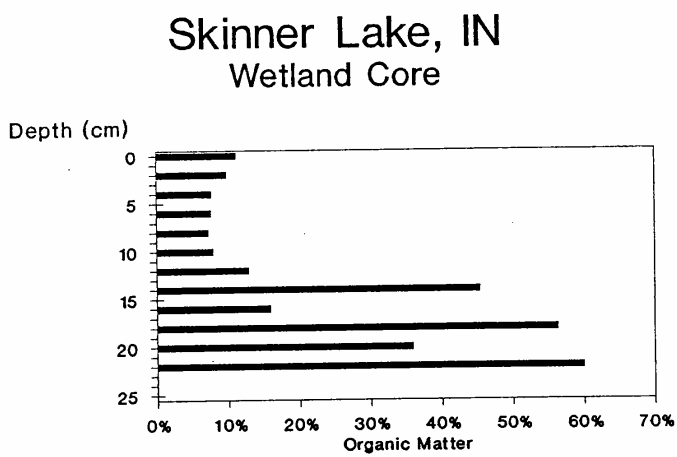

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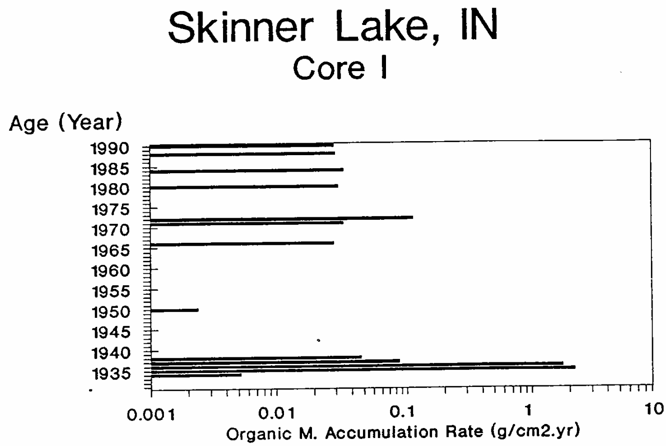


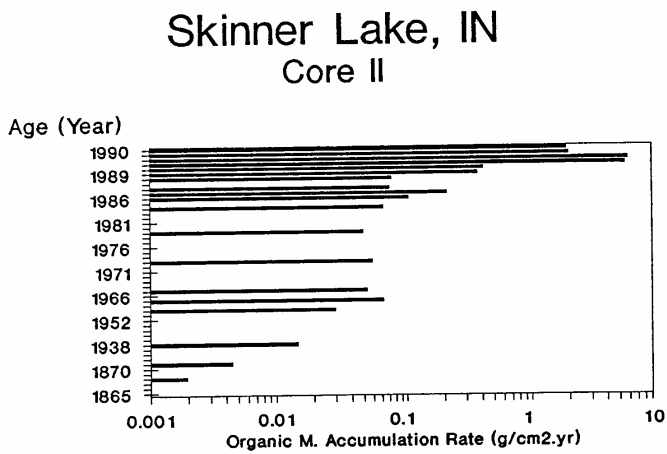
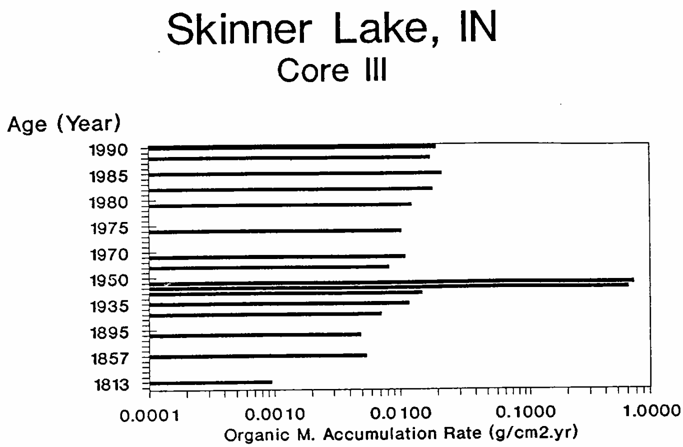


Figure 11. Accumulation Rates of Organic Matter in Sediment Cores.



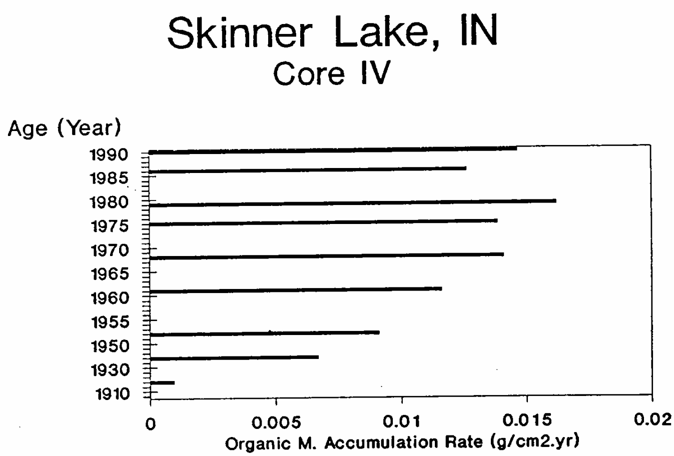
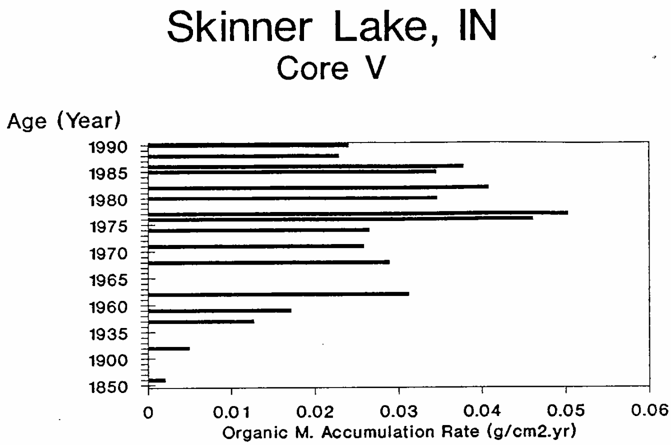


Figure 11. Continued.



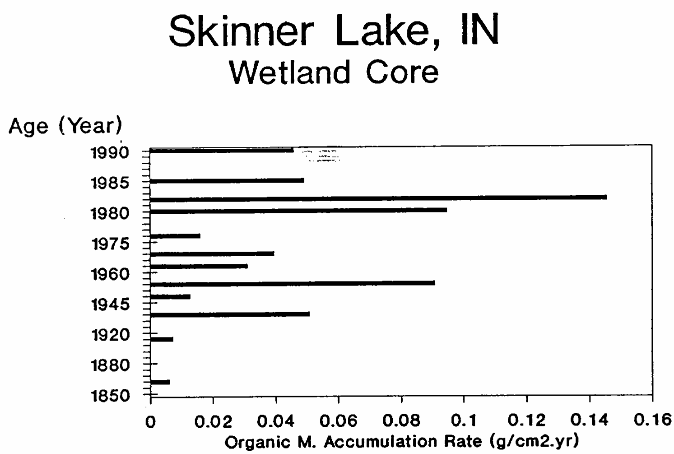


Figure 11. Continued.

increased following installation of the Rimmel sedimentation basin, while those at the sites farthest from the Rimmel Ditch (sites IV and V) declined during the same period. It is not possible with the current study to determine whether the recent increased organic matter accumulation rates at nearshore lake stations are the result of in situ stimulation of primary productivity via nutrients delivered from the watershed or reflect increased delivery of allochthonous organic matter from the watershed associated with channel scouring of ditch water into the highly organic sediments of the preexisting wetland incorporated into the Rimmel sedimentation basin.

Sediment Phosphorus

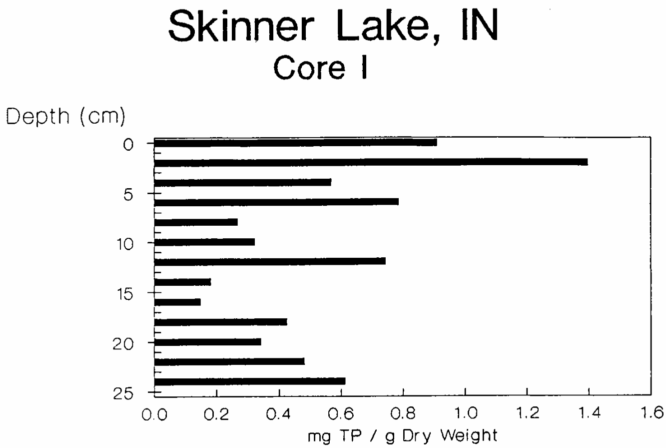
Although total phosphorus concentrations (mg TP/g sediment dry weight) displayed a great deal of intracore variability at every coring site, they were generally greater at the bottom and top of each profile than in the middle (Figure 12). Concentrations tended to be greater throughout the length of cores from sites (III-V) farthest from the inlet of Rimmel Ditch to Skinner Lake.

With the exception of core I, accumulation rates of total phosphorus in all cores increased markedly during the 1930's and remained and elevated levels until the present (Figure 13). Considering data generated through 1985, it appears that construction of the Rimmel sedimentation basin had little noticeable impact on annual accumulation rates of phosphorus in sediments of Skinner Lake. After 1985, total phosphorus accumulation increased in cores I-III, remained relatively constant in core IV, and decreased in core V.

SUMMARY AND CONCLUSIONS

A paleolimnological investigation of five cores from Skinner Lake, Indiana and one core from the Rimmel Ditch sedimentation basin/wetland was conducted to assess whether installation of the Rimmel sedimentation basin had a pronounced effect on delivery rates of watershed derived erosion products and total phosphorus to Skinner Lake. Sediment cores were dated by currently accepted ^{210}Pb methodology, and the resulting chronologies were used to calculate accumulation rates of dry sediment, organic matter, inorganic matter, and total phosphorus for each core.

The Rimmel sedimentation basin does not appear to have been effective at trapping sediment since its formation, and a sediment delta has formed at least 140 meters into Skinner



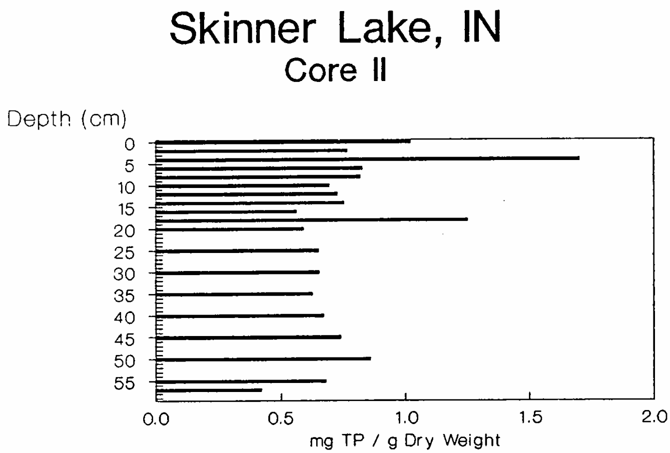
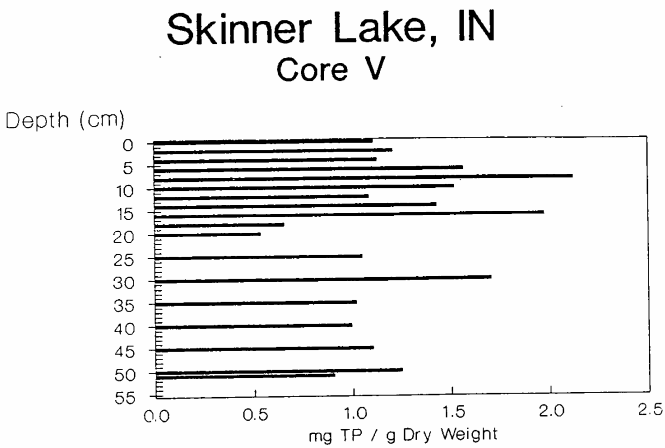


Figure 12. Total Phosphorus Concentrations in Sediment Cores.



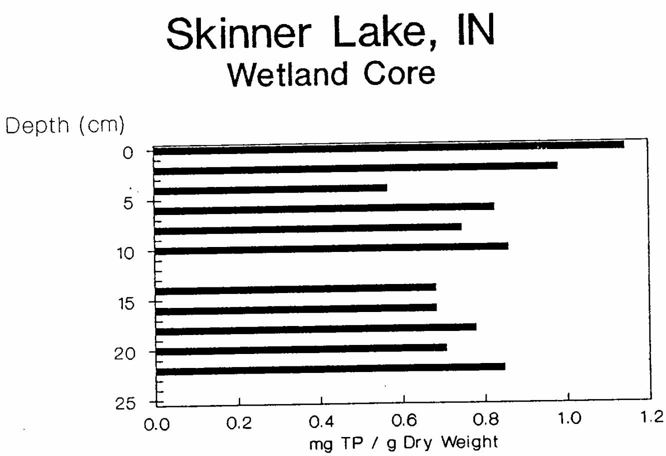
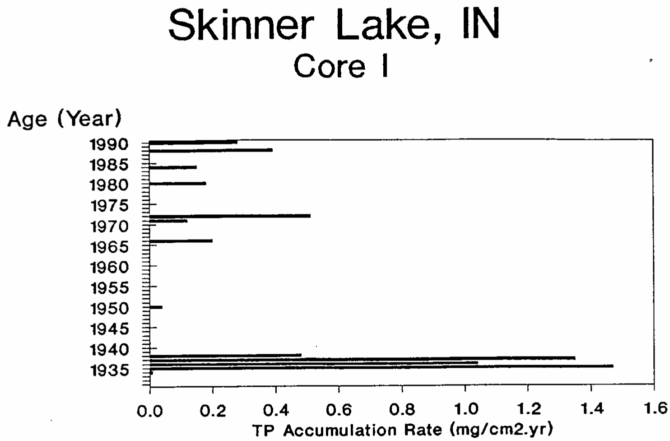


Figure 12. Continued.



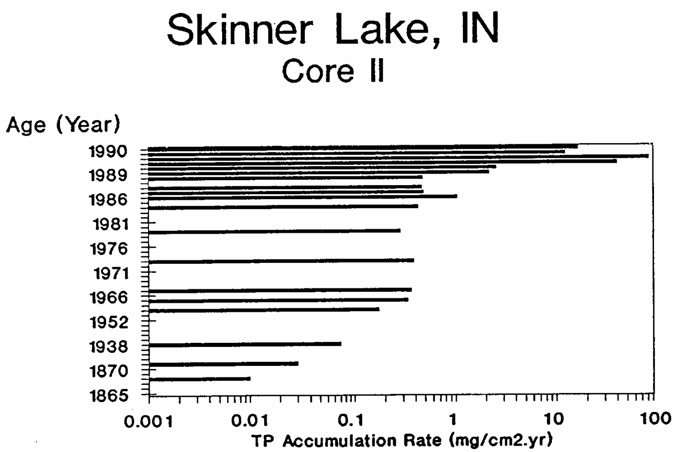
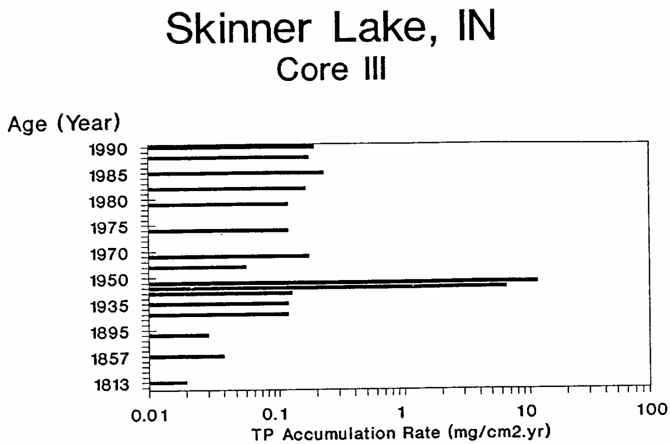


Figure 13. Accumulation Rates of Total Phosphorus in Sediment Cores.



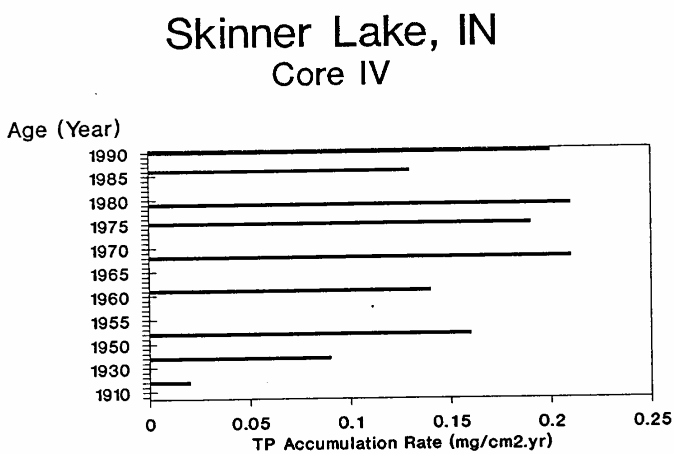
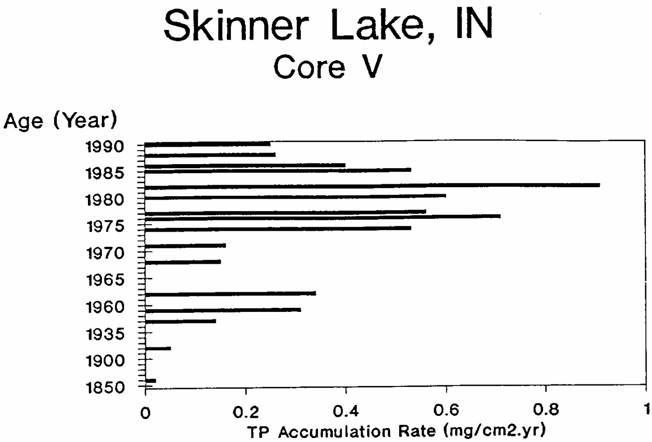


Figure 13. Continued.



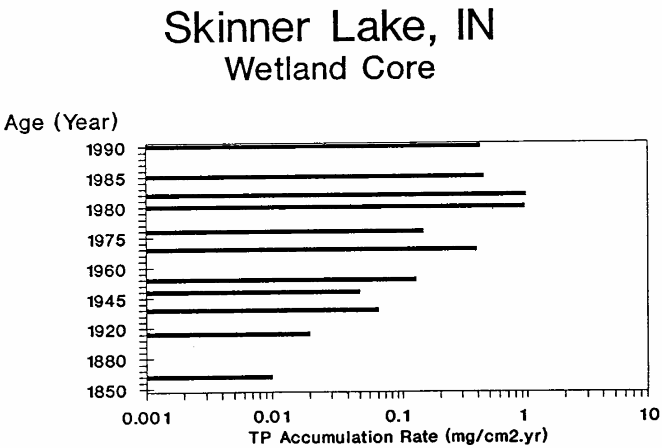


Figure 13. Continued.

Lake during at least the past decade. Construction of the sedimentation basin as part of the watershed management program of 1979-1982 did not reduce accumulation rates of total dry sediment, inorganic matter, organic matter and total phosphorus in Skinner Lake.

Accumulation rates of total dry sediment, inorganic matter, organic matter, and total phosphorus all increased beginning in the mid 1980's following sedimentation basin construction. Although the present study can not conclusively determine the relative importance of increasing watershed erosion rates versus channel scouring through the Rimmel sedimentation basin with subsequent redeposition of material in Skinner Lake as controlling factors for the observed increase, field observations indicated that a channel 2-3 meters deep has been excised through the Rimmel sedimentation basin since its formation.

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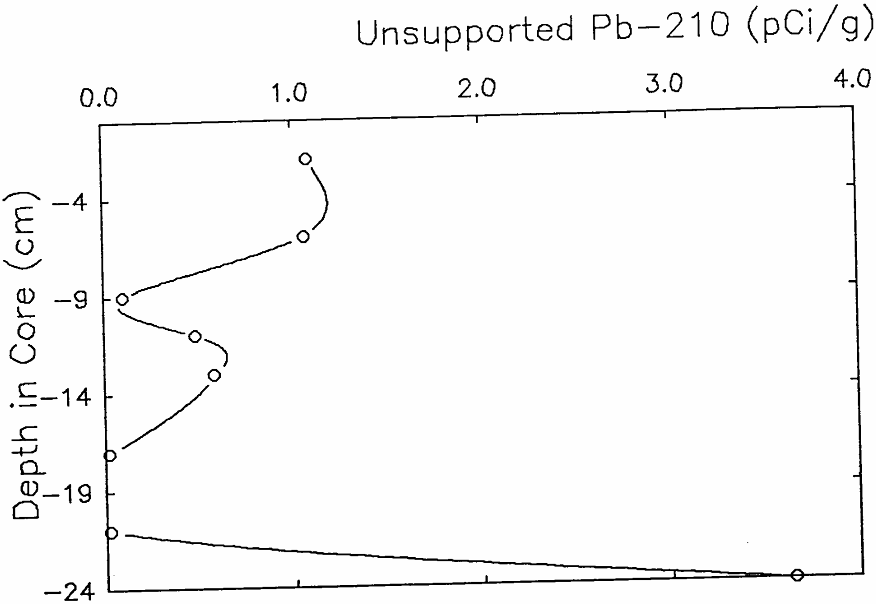
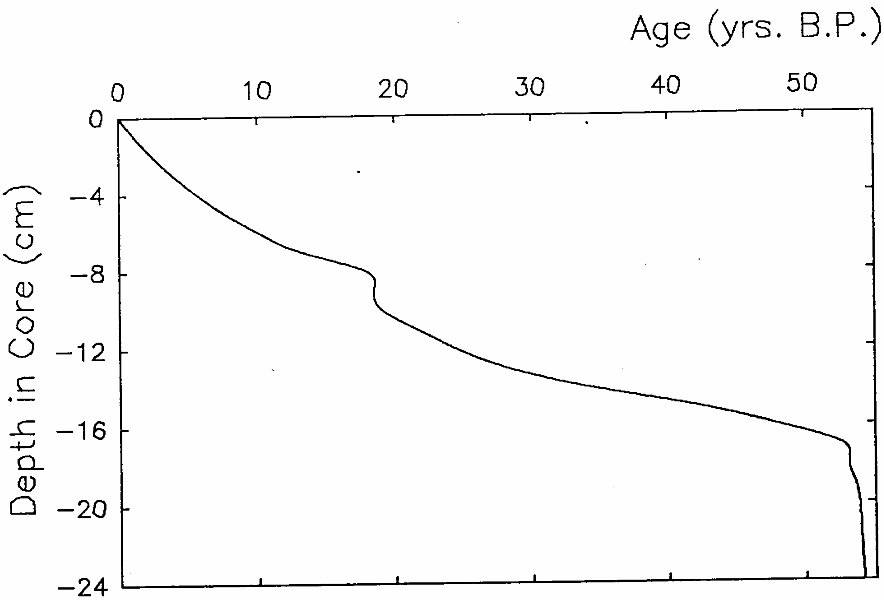
APPENDICES

SKINNER: CORE I.

Core Int. (cm)	Bulk Density (g/cm3)	Unsupp. Pb-210 (pCi/g)	Unsupp. Pb-210 (pCi/cm2)	Cum.Res. Unsupp PB-210(pCi/cm2)	Age (yrs.B.P.)	Sed. Rate (g/cm2.yr)
0 - 1	0.34	1.08	0.36	10.54	0.00	0.30
1 - 2	0.37	1.08	0.40	10.17	1.12	0.29
2 - 3	0.41	1.08	0.44	9.77	2.42	0.28
3 - 4	0.46	1.08	0.49	9.33	3.91	0.27
4 - 5	0.50	1.06	0.53	8.84	5.65	0.26
5 - 6	0.58	1.06	0.61	8.30	7.65	0.24
6 - 7	0.66	1.06	0.70	7.69	10.12	0.23
7 - 8	0.90	1.06	0.95	6.99	13.17	0.21
8 - 9	1.14	0.10	0.11	6.04	17.85	1.88
9 - 10	1.03	0.10	0.10	5.93	18.46	1.85
10 - 11	0.93	0.48	0.45	5.83	19.03	0.38
11 - 12	0.94	0.48	0.45	5.38	21.59	0.35
12 - 13	0.94	0.58	0.55	4.93	24.39	0.26
13 - 14	1.28	0.58	0.74	4.38	28.17	0.24
14 - 15	1.62	0.49	0.80	3.64	34.15	0.23
15 - 16	1.57	0.49	0.77	2.84	42.07	0.18
16 - 17	1.51	0.02	0.03	2.07	52.19	3.23
17 - 18	1.46	0.02	0.03	2.04	52.66	3.18
18 - 19	1.41	0.02	0.03	2.01	53.13	3.14
19 - 20	0.82	0.02	0.02	1.99	53.58	3.09
20 - 21	0.23	0.02	0.00	1.97	53.85	3.07
21 - 22	0.21	0.02	0.00	1.97	53.92	3.06
22 - 23	0.19	0.02	0.00	1.96	53.99	3.05
23 - 24	0.36	0.02	0.01	1.96	54.05	3.05
24 - 25	0.53	3.65	1.95	1.95	54.17	0.02



UNSUPPORTED PB−210 CONCENTRATION − SKINNER CORE I



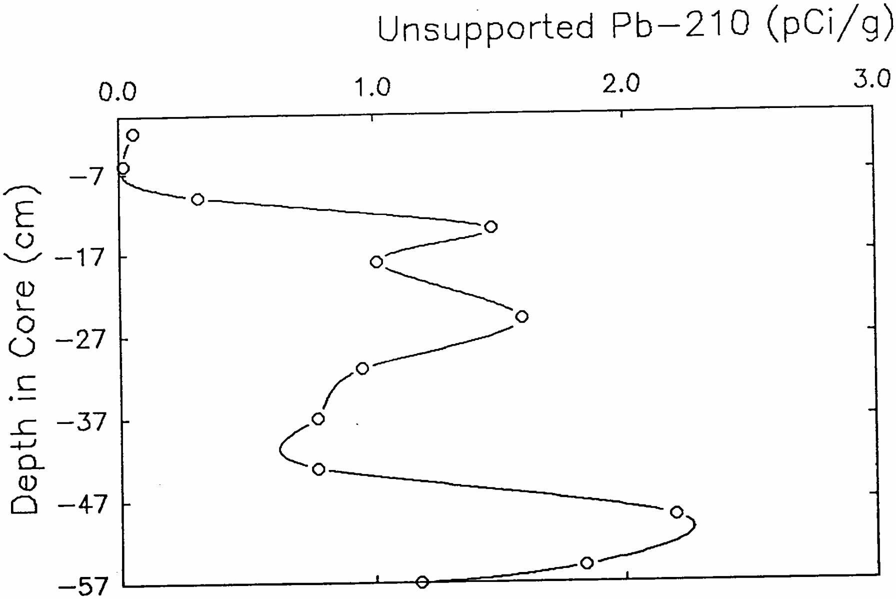
SKINNER CORE I — AGE VS. DEPTH CURVE

SKINNER: CORE I.

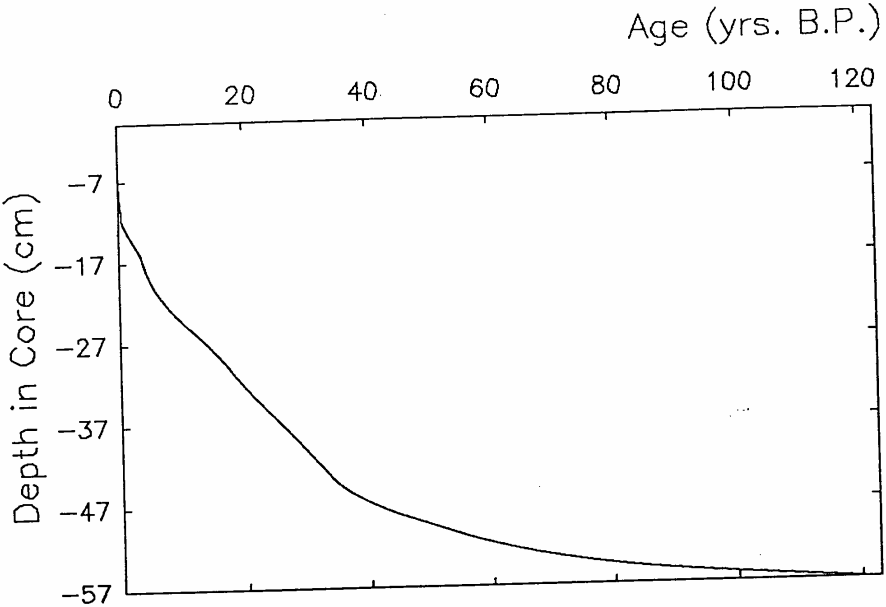
Age (yrs.B.P.)	Sed. Rate (g/cm2.yr)	TP Conc (mg/g dry weight)	TP Acc Rt (mg/cm2.yr)	Core Int. (cm)
0.00	0.30	0.91	0.28	0 – 1
1.12	0.29			1 – 2
2.42	0.28	1.40	0.39	2 – 3
3.91	0.27			3 – 4
5.65	0.26	0.57	0.15	4 – 5
7.65	0.24			5 – 6
10.12	0.23	0.79	0.18	6 – 7
13.17	0.21			7 – 8
17.85	1.88	0.27	0.51	8 – 9
18.46	1.85			9 – 10
19.03	0.38	0.32	0.12	10 – 11
21.59	0.35			11 – 12
24.39	0.26	0.74	0.20	12 – 13
28.17	0.24			13 – 14
34.15	0.23	0.18	0.04	14 – 15
42.07	0.18			15 – 16
52.19	3.23	0.15	0.48	16 – 17
52.66	3.18			17 – 18
53.13	3.14	0.43	1.35	18 – 19
53.58	3.09			19 – 20
53.85	3.07	0.34	1.04	20 – 21
53.92	3.06			21 – 22
53.99	3.05	0.48	1.47	22 – 23
54.05	3.05			23 – 24
54.17	0.02	0.61	0.01	24 – 25

SKINNER: CORE II.

Core Int. (cm)	Bulk Density (g/cm3)	Unsupp. Pb-210 (pCi/g)	Unsupp. Pb-210 (pCi/cm2)	Cum.Res. Unsupp PB-210(pCi/cm2)	Age (yrs B.P.)	Sed. Rate (g/cm2.yr)
0 - 1	0.33	0.06	0.02	34.04	0.00	17.67
1 - 2	0.32	0.06	0.02	34.02	0.02	17.66
2 - 3	0.30	0.06	0.02	34.00	0.04	17.65
3 - 4	0.33	0.06	0.02	33.99	0.05	17.64
4 - 5	0.35	0.02	0.01	33.97	0.07	52.89
5 - 6	0.37	0.02	0.01	33.96	0.08	52.88
6 - 7	0.40	0.02	0.01	33.95	0.09	52.86
7 - 8	0.38	0.02	0.01	33.94	0.09	52.85
8 - 9	0.36	0.31	0.11	33.94	0.10	3.41
9 - 10	0.41	0.31	0.13	33.83	0.21	3.40
10 - 11	0.47	0.31	0.15	33.70	0.33	3.39
11 - 12	0.46	0.31	0.14	33.55	0.47	3.37
12 - 13	0.45	1.47	0.66	33.41	0.60	0.71
13 - 14	0.49	1.47	0.72	32.75	1.24	0.69
14 - 15	0.54	1.47	0.79	32.03	1.96	0.68
15 - 16	0.46	1.47	0.68	31.24	2.76	0.66
16 - 17	0.39	1.01	0.40	30.56	3.47	0.94
17 - 18	0.45	1.01	0.45	30.16	3.89	0.93
18 - 19	0.50	1.01	0.51	29.71	4.38	0.92
19 - 20	0.59	1.01	0.59	29.20	4.93	0.90
20 - 21	0.67	1.13	0.75	28.61	5.59	0.79
21 - 22	0.66	1.24	0.82	27.85	6.45	0.70
22 - 23	0.66	1.36	0.89	27.03	7.41	0.62
23 - 24	0.65	1.47	0.96	26.13	8.49	0.55
24 - 25	0.65	1.59	1.03	25.17	9.70	0.49
25 - 26	0.65	1.59	1.03	24.14	11.04	0.47
26 - 27	0.65	1.46	0.94	23.11	12.44	0.49
27 - 28	0.65	1.33	0.86	22.17	13.78	0.52
28 - 29	0.65	1.21	0.78	21.31	15.05	0.55
29 - 30	0.65	1.08	0.70	20.53	16.24	0.59
30 - 31	0.65	0.95	0.61	19.83	17.35	0.65
31 - 32	0.69	0.95	0.65	19.22	18.36	0.63
32 - 33	0.73	0.91	0.66	18.57	19.47	0.63
33 - 34	0.77	0.88	0.67	17.90	20.64	0.64
34 - 35	0.81	0.84	0.68	17.23	21.87	0.64
35 - 36	0.85	0.81	0.69	16.55	23.16	0.64
36 - 37	0.81	0.77	0.62	15.86	24.52	0.64
37 - 38	0.77	0.77	0.59	15.24	25.81	0.62
38 - 39	0.72	0.77	0.56	14.65	27.07	0.59
39 - 40	0.68	0.77	0.52	14.10	28.32	0.57
40 - 41	0.64	0.77	0.49	13.57	29.53	0.55
41 - 42	0.62	0.77	0.48	13.08	30.72	0.53
42 - 43	0.60	0.77	0.46	12.60	31.92	0.51
43 - 44	0.59	0.77	0.45	12.14	33.12	0.49
44 - 45	0.57	1.06	0.60	11.69	34.34	0.34
45 - 46	0.55	1.34	0.74	11.09	36.03	0.26
46 - 47	0.52	1.63	0.84	10.35	38.24	0.20
47 - 48	0.48	1.91	0.92	9.51	40.95	0.15
48 - 49	0.45	2.20	0.98	8.59	44.22	0.12
49 - 50	0.41	2.20	0.91	7.61	48.12	0.11
50 - 51	0.38	2.13	0.80	6.70	52.19	0.10
51 - 52	0.41	2.06	0.84	5.90	56.29	0.09
52 - 53	0.43	1.98	0.86	5.06	61.19	0.08
53 - 54	0.46	1.91	0.89	4.20	67.19	0.07
54 - 55	0.49	1.84	0.91	3.31	74.80	0.06
55 - 56	0.52	1.84	0.96	2.41	85.06	0.04
56 - 57	0.58	1.18	0.69	1.45	101.36	0.04
57 - 58	0.65	1.18	0.76	0.76	122.04	0.02



UNSUPPORTED PB−210 CONCENTRATION − SKINNER CORE II



SKINNER CORE II – AGE VS. DEPTH CURVE

PLAUSIBLE PROFILE FOR A COMPLETE CORE II:SKINNER LAKE

Core Int. (cm)	Bulk Density (g/cm3)	Unsupp. Pb-210 (pCi/g)	Unsupp. Pb-210 (pCi/cm2)	Cum.Res. Unsupp PB-210(pCi/cm2)	Age (yrs B.P.)	Sed. Rate (g/cm2.yr)
0 - 1	0.33	1.63	0.54	15.34	0.00	0.29
1 - 2	0.32	1.91	0.61	14.80	1.15	0.24
2 - 3	0.30	2.20	0.66	14.19	2.50	0.20
3 - 4	0.33	2.20	0.73	13.53	4.03	0.19
4 - 5	0.35	2.13	0.74	12.80	5.80	0.19
5 - 6	0.37	2.06	0.76	12.06	7.73	0.18
6 - 7	0.40	1.98	0.79	11.30	9.82	0.18
7 - 8	0.38	1.91	0.73	10.50	12.16	0.17
8 - 9	0.36	1.84	0.66	9.78	14.46	0.17
9 - 10	0.41	1.84	0.75	9.11	16.71	0.15
10 - 11	0.47	1.18	0.55	8.36	19.49	0.22
11 - 12	0.46	1.18	0.54	7.81	21.69	0.21
12 - 13	0.45	1.13	0.51	7.26	24.01	0.20
13 - 14	0.49	1.08	0.53	6.75	26.34	0.19
14 - 15	0.54	1.03	0.56	6.22	28.96	0.19
15 - 16	0.46	0.98	0.45	5.67	31.96	0.18
16 - 17	0.39	0.93	0.36	5.22	34.63	0.17
17 - 18	0.45	0.88	0.40	4.86	36.94	0.17
18 - 19	0.50	0.83	0.41	4.46	39.67	0.17
19 - 20	0.59	0.78	0.46	4.04	42.81	0.16
20 - 21	0.67	0.73	0.49	3.58	46.69	0.15
21 - 22	0.66	0.68	0.45	3.09	51.40	0.14
22 - 23	0.66	0.63	0.42	2.65	56.43	0.13
23 - 24	0.65	0.58	0.38	2.23	61.92	0.12
24 - 25	0.65	0.53	0.34	1.85	67.87	0.11
25 - 26	0.65	0.48	0.31	1.51	74.47	0.10
26 - 27	0.65	0.43	0.28	1.20	81.91	0.09
27 - 28	0.65	0.38	0.25	0.92	90.45	0.08
28 - 29	0.65	0.33	0.21	0.67	100.53	0.06
29 - 30	0.65	0.28	0.18	0.46	112.92	0.05
30 - 31	0.65	0.23	0.15	0.27	129.29	0.04
31 - 32	0.69	0.18	0.12	0.12	154.66	0.02

SKINNER: CORE II.

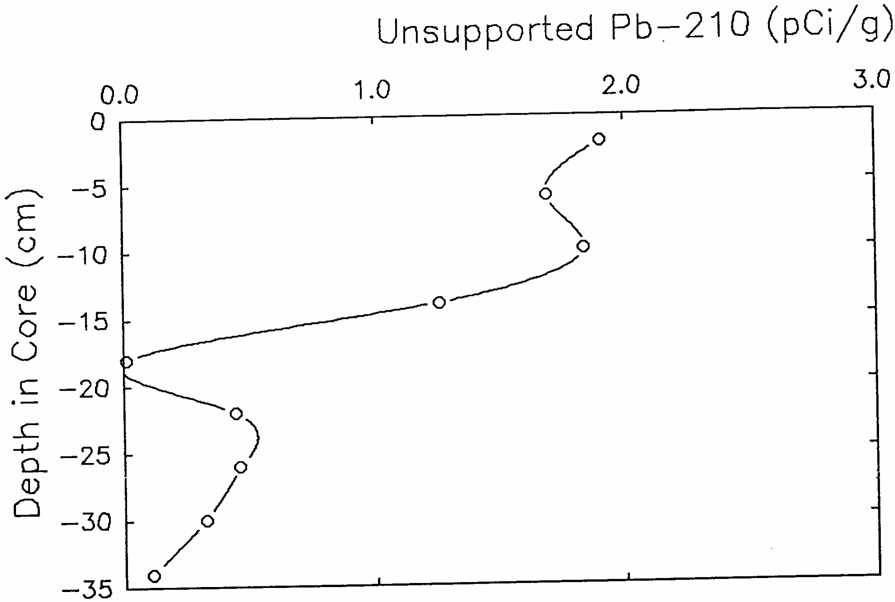
Age (yrs B.P.)	Sed. Rate (g/cm2.yr)	TP Conc (mg/g dry weight)	TP Acc Rt (mg/cm2.yr)	Core Int. (cm)
0.00	17.67	1.02	18.02	0 - 1
0.02	17.66			1 - 2
0.04	17.65	0.77	13.59	2 - 3
0.05	17.64			3 - 4
0.07	52.89	1.70	89.91	4 - 5
0.08	52.88			5 - 6
0.09	52.86	0.83	43.88	6 - 7
0.09	52.85			7 - 8
0.10	3.41	0.82	2.80	8 - 9
0.21	3.40			9 - 10
0.33	3.39	0.70	2.37	10 - 11
0.47	3.37			11 - 12
0.60	0.71	0.73	0.52	12 - 13
1.24	0.69			13 - 14
1.96	0.68	0.75	0.51	14 - 15
2.76	0.66			15 - 16
3.47	0.94	0.56	0.53	16 - 17
3.89	0.93			17 - 18
4.38	0.92	1.25	1.14	18 - 19
4.93	0.90			19 - 20
5.59	0.79	0.59	0.47	20 - 21
6.45	0.70			21 - 22
7.41	0.62			22 - 23
8.49	0.55			23 - 24
9.70	0.49			24 - 25
11.04	0.47	0.65	0.31	25 - 26
12.44	0.49			26 - 27
13.78	0.52			27 - 28
15.05	0.55			28 - 29
16.24	0.59			29 - 30
17.35	0.65	0.65	0.42	30 - 31
18.36	0.63			31 - 32
19.47	0.63			32 - 33
20.64	0.64			33 - 34
21.87	0.64			34 - 35
23.16	0.64	0.63	0.40	35 - 36
24.52	0.64			36 - 37
25.81	0.62			37 - 38
27.07	0.59			38 - 39
28.32	0.57			39 - 40
29.53	0.55	0.67	0.37	40 - 41
30.72	0.53			41 - 42
31.92	0.51			42 - 43
33.12	0.49			43 - 44
34.34	0.34			44 - 45
36.03	0.26	0.74	0.19	45 - 46
38.24	0.20			46 - 47
40.95	0.15			47 - 48
44.22	0.12			48 - 49
48.12	0.11			49 - 50
52.19	0.10	0.86	0.08	50 - 51
56.29	0.09			51 - 52
61.19	0.08			52 - 53
67.19	0.07			53 - 54
74.80	0.06			54 - 55
85.06	0.04	0.68	0.03	55 - 56
101.36	0.04			56 - 57
122.04	0.02	0.42	0.01	57 - 58

PLAUSIBLE PROFILE–COMPLETE CORE II:SKINNER LAKE *)				
Age (yrs B.P.)	Sed. Rate (g/cm2.yr)	TP Conc (mg/g dry weight)	TP Acc Rt (mg/cm2.yr)	Core Int. (cm)
0.00	0.29	0.74	0.22	0 - 1
1.15	0.24			1 - 2
2.50	0.20			2 - 3
4.03	0.19			3 - 4
5.80	0.19			4 - 5
7.73	0.18	0.86	0.16	5 - 6
9.82	0.18			6 - 7
12.16	0.17			7 - 8
14.46	0.17			8 - 9
16.71	0.15			9 - 10
19.49	0.22	0.68	0.15	10 - 11
21.69	0.21			11 - 12
24.01	0.20	0.42	0.08	12 - 13
26.34	0.19			13 - 14
28.96	0.19			14 - 15
31.96	0.18			15 - 16
34.63	0.17			16 - 17
36.94	0.17			17 - 18
39.67	0.17			18 - 19
42.81	0.16			19 - 20
46.69	0.15			20 - 21
51.40	0.14			21 - 22
56.43	0.13			22 - 23
61.92	0.12			23 - 24
67.87	0.11			24 - 25
74.47	0.10			25 - 26
81.91	0.09			26 - 27
90.45	0.08			27 - 28
100.53	0.06			28 - 29
112.92	0.05			29 - 30
129.29	0.04			30 - 31
154.66	0.02			31 - 32

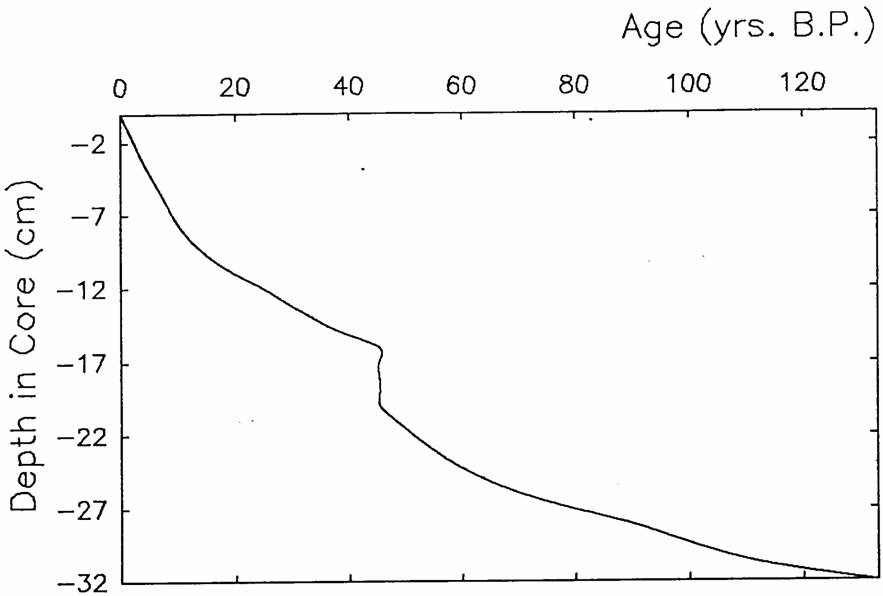
*) See assumptions for this profile in my earlier write-up.

SKINNER: CORE III.

Core Int. (cm)	Bulk Density (g/cm3)	Unsupp. Pb-210 (pCi/g)	Unsupp. Pb-210 (pCi/cm2)	Cum.Res. Unsupp PB-210(pCi/cm2)	Age (yrs B.P.)	Sed. Rate (g/cm2.yr)
0 - 1	0.22	1.91	0.41	10.86	0.00	0.18
1 - 2	0.20	1.91	0.38	10.45	1.24	0.17
2 - 3	0.18	1.91	0.35	10.07	2.43	0.16
3 - 4	0.21	1.91	0.40	9.72	3.56	0.16
4 - 5	0.24	1.69	0.41	9.32	4.91	0.17
5 - 6	0.22	1.69	0.38	8.91	6.34	0.16
6 - 7	0.21	1.69	0.35	8.54	7.72	0.16
7 - 8	0.24	1.69	0.41	8.19	9.06	0.15
8 - 9	0.28	1.84	0.52	7.78	10.71	0.13
9 - 10	0.35	1.84	0.64	7.26	12.94	0.12
10 - 11	0.42	1.84	0.77	6.62	15.92	0.11
11 - 12	0.45	1.84	0.83	5.85	19.87	0.10
12 - 13	0.49	1.26	0.61	5.02	24.78	0.12
13 - 14	0.47	1.26	0.59	4.41	28.95	0.11
14 - 15	0.45	1.26	0.56	3.82	33.54	0.09
15 - 16	0.48	1.26	0.60	3.26	38.66	0.08
16 - 17	0.51	0.01	0.01	2.65	45.25	8.27
17 - 18	0.52	0.01	0.01	2.65	45.31	8.25
18 - 19	0.52	0.01	0.01	2.64	45.37	8.23
19 - 20	0.51	0.01	0.01	2.64	45.43	8.22
20 - 21	0.50	0.44	0.22	2.63	45.50	0.19
21 - 22	0.50	0.44	0.22	2.42	48.27	0.17
22 - 23	0.51	0.44	0.22	2.19	51.35	0.16
23 - 24	0.52	0.44	0.23	1.97	54.81	0.14
24 - 25	0.56	0.46	0.25	1.74	58.74	0.12
25 - 26	0.60	0.46	0.27	1.49	63.80	0.10
26 - 27	0.64	0.46	0.29	1.22	70.28	0.08
27 - 28	0.55	0.46	0.25	0.93	79.05	0.06
28 - 29	0.45	0.32	0.15	0.68	89.12	0.07
29 - 30	0.36	0.32	0.12	0.53	96.87	0.05
30 - 31	0.37	0.32	0.12	0.42	104.77	0.04
31 - 32	0.38	0.32	0.12	0.30	115.60	0.03
32 - 33	0.39	0.11	0.04	0.17	132.64	0.05
33 - 34	0.40	0.11	0.04	0.13	141.73	0.04
34 - 35	0.40	0.11	0.04	0.09	154.61	0.02
35 - 36	0.40	0.11	0.04	0.04	176.73	0.01



UNSUPPORTED PB-210 CONCENTRATION – SKINNER CORE III

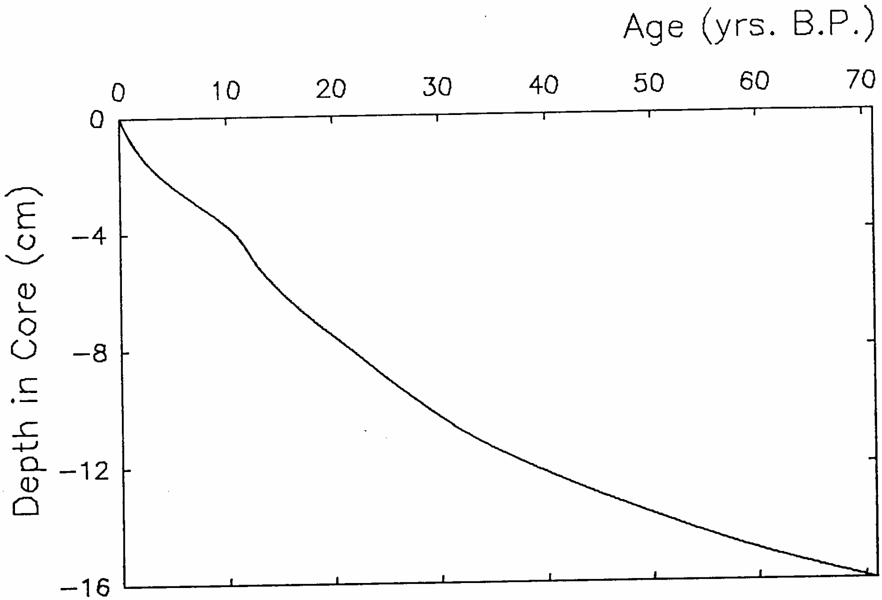


SKINNER CORE III — AGE VS. DEPTH CURVE

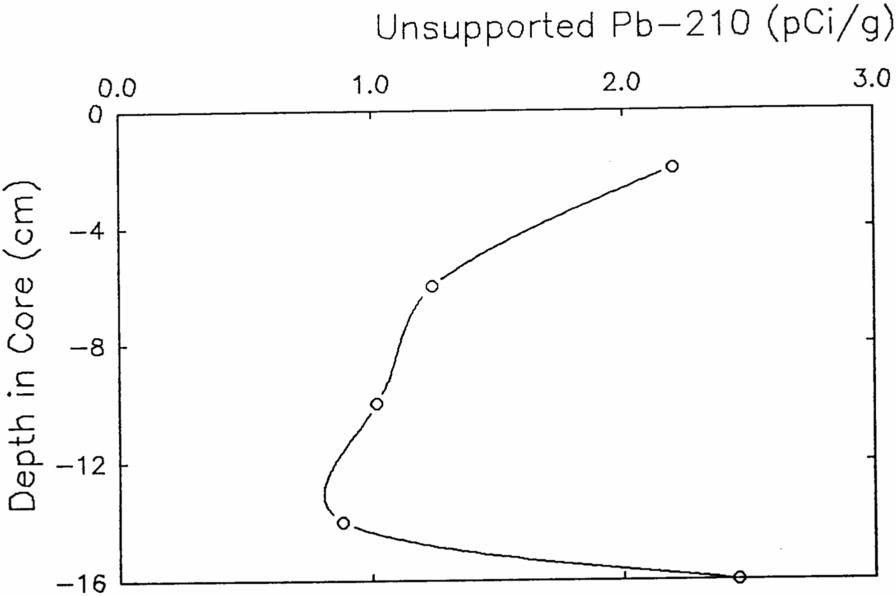
SKINNER: CORE III.				
Age (yrs B.P.)	Sed. Rate (g/cm2.yr)	TP Conc (mg/g dry weight)	TP Acc Rt (mg/cm2.yr)	Core Int. (cm)
0.00	0.18	1.17	0.21	0 - 1
1.24	0.17			1 - 2
2.43	0.16	1.15	0.19	2 - 3
3.56	0.16			3 - 4
4.91	0.17	1.47	0.25	4 - 5
6.34	0.16			5 - 6
7.72	0.16	1.16	0.18	6 - 7
9.06	0.15			7 - 8
10.71	0.13	0.99	0.13	8 - 9
12.94	0.12			9 - 10
15.92	0.11	1.13	0.13	10 - 11
19.87	0.10			11 - 12
24.78	0.12	1.54	0.19	12 - 13
28.95	0.11			13 - 14
33.54	0.09	0.63	0.06	14 - 15
38.66	0.08			15 - 16
45.25	8.27	1.53	12.65	16 - 17
45.31	8.25			17 - 18
45.37	8.23	0.87	7.16	18 - 19
45.43	8.22			19 - 20
45.50	0.19	0.75	0.14	20 - 21
48.27	0.17			21 - 22
51.35	0.16			22 - 23
54.81	0.14	0.93	0.13	23 - 24
58.74	0.12			24 - 25
63.80	0.10			25 - 26
70.28	0.08	1.56	0.13	26 - 27
79.05	0.06			27 - 28
89.12	0.07			28 - 29
96.87	0.05	0.52	0.03	29 - 30
104.77	0.04			30 - 31
115.60	0.03			31 - 32
132.64	0.05	0.90	0.04	32 - 33
141.73	0.04			33 - 34
154.61	0.02			34 - 35
176.73	0.01	1.63	0.02	35 - 36

SKINNER: CORE IV.

Core Int. (cm)	Bulk Density (g/cm3)	Unsupp. Pb-210 (pCi/g)	Unsupp. Pb-210 (pCi/cm2)	Cum.Res. Unsupp PB-210(pCi/cm2)	Age (yrs B.P.)	Sed. Rate (g/cm2.yr)
0 - 1	0.19	2.20	0.41	9.44	0.00	0.13
1 - 2	0.29	2.20	0.64	9.03	1.44	0.13
2 - 3	0.39	2.20	0.86	8.39	3.78	0.12
3 - 4	0.35	2.20	0.77	7.53	7.25	0.11
4 - 5	0.31	1.24	0.39	6.76	10.71	0.17
5 - 6	0.37	1.24	0.46	6.38	12.59	0.16
6 - 7	0.43	1.24	0.54	5.92	15.00	0.15
7 - 8	0.45	1.24	0.56	5.38	18.05	0.14
8 - 9	0.47	1.02	0.48	4.82	21.60	0.15
9 - 10	0.47	1.02	0.48	4.33	25.00	0.13
10 - 11	0.46	1.02	0.47	3.86	28.74	0.12
11 - 12	0.52	1.02	0.54	3.39	32.88	0.10
12 - 13	0.59	0.88	0.52	2.86	38.40	0.10
13 - 14	0.54	0.88	0.47	2.34	44.86	0.08
14 - 15	0.48	0.88	0.43	1.86	52.13	0.07
15 - 16	0.45	0.88	0.40	1.44	60.45	0.05
16 - 17	0.42	2.46	1.04	1.04	70.87	0.01



SKINNER CORE IV — AGE VS. DEPTH CURVE



UNSUPPORTED PB−210 CONCENTRATION − SKINNER CORE IV

PLAUSIBLE PROFILE FOR A COMPLETE CORE IV: SKINNER LAKE

Core Int. (cm)	Bulk Density (g/cm3)	Unsupp. Pb-210 (pCi/g)	Unsupp. Pb-210 (pCi/cm2)	Cum.Res. Unsupp PB-210(pCi/cm2)	Age (yrs B.P.)	Sed. Rate (g/cm2.yr)
0 - 1	0.19	2.20	0.41	16.59	0.00	0.23
1 - 2	0.29	2.20	0.64	16.18	0.81	0.23
2 - 3	0.39	2.20	0.86	15.54	2.10	0.22
3 - 4	0.35	2.20	0.77	14.69	3.92	0.21
4 - 5	0.31	1.24	0.39	13.91	5.65	0.35
5 - 6	0.37	1.24	0.46	13.53	6.55	0.34
6 - 7	0.43	1.24	0.54	13.07	7.67	0.33
7 - 8	0.45	1.24	0.56	12.53	9.01	0.31
8 - 9	0.47	1.02	0.48	11.97	10.49	0.37
9 - 10	0.47	1.02	0.48	11.48	11.81	0.35
10 - 11	0.46	1.02	0.47	11.01	13.17	0.34
11 - 12	0.52	1.02	0.54	10.54	14.57	0.32
12 - 13	0.59	0.88	0.52	10.01	16.24	0.35
13 - 14	0.54	0.88	0.47	9.49	17.96	0.34
14 - 15	0.48	0.88	0.43	9.01	19.60	0.32
15 - 16	0.45	0.88	0.40	8.59	21.15	0.30
16 - 17	0.42	2.46	1.04	8.19	22.68	0.10
17 - 18	0.35	2.31	0.81	7.15	27.03	0.10
18 - 19	0.35	2.16	0.76	6.34	30.88	0.09
19 - 20	0.35	2.01	0.70	5.59	34.96	0.09
20 - 21	0.35	1.86	0.65	4.88	39.28	0.08
21 - 22	0.35	1.71	0.60	4.23	43.88	0.08
22 - 23	0.35	1.56	0.55	3.63	48.78	0.07
23 - 24	0.35	1.41	0.49	3.09	54.01	0.07
24 - 25	0.35	1.26	0.44	2.59	59.60	0.06
25 - 26	0.35	1.11	0.39	2.15	65.58	0.06
26 - 27	0.35	0.96	0.34	1.76	71.98	0.06
27 - 28	0.35	0.86	0.30	1.43	78.76	0.05
28 - 29	0.35	0.76	0.27	1.13	86.36	0.05
29 - 30	0.35	0.66	0.23	0.86	95.01	0.04
30 - 31	0.35	0.56	0.20	0.63	105.04	0.04
31 - 32	0.35	0.46	0.16	0.43	117.01	0.03
32 - 33	0.35	0.36	0.13	0.27	131.90	0.02
33 - 34	0.35	0.26	0.09	0.15	151.77	0.02
34 - 35	0.35	0.16	0.06	0.06	182.77	0.01
35 - 36	0.35					
36 - 37	0.35					

SKINNER: CORE IV.

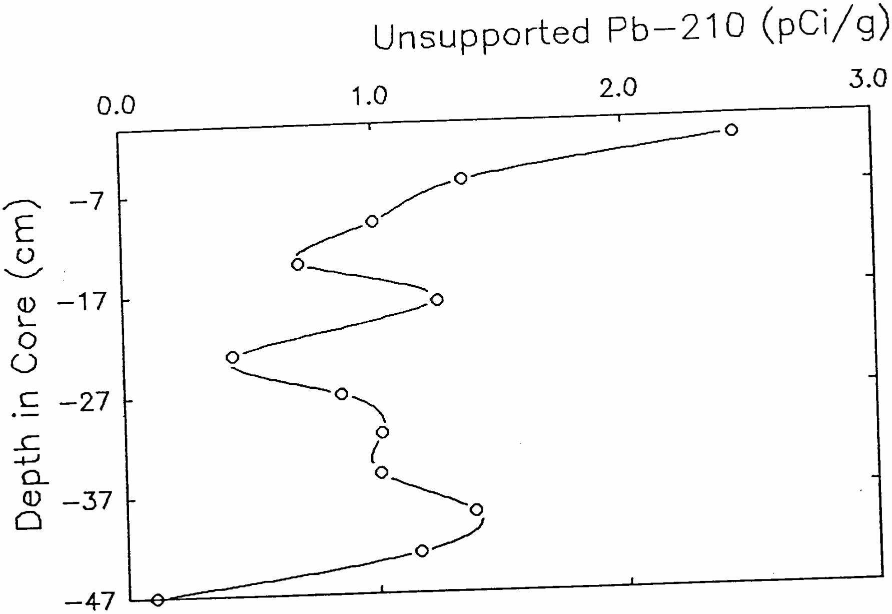
Age (yrs B.P.)	Sed. Rate (g/cm2.yr)	TP Conc (mg/g dry weight)	TP Acc Rt (mg/cm2.yr)	Core Int. (cm)
0.00	0.13	1.50	0.20	0 - 1
1.44	0.13			1 - 2
3.78	0.12	1.11	0.13	2 - 3
7.25	0.11			3 - 4
10.71	0.17	1.26	0.21	4 - 5
12.59	0.16			5 - 6
15.00	0.15	1.25	0.19	6 - 7
18.05	0.14			7 - 8
21.60	0.15	1.42	0.21	8 - 9
25.00	0.13			9 - 10
28.74	0.12	1.22	0.14	10 - 11
32.88	0.10			11 - 12
38.40	0.10	1.58	0.16	12 - 13
44.86	0.08			13 - 14
52.13	0.07	1.31	0.09	14 - 15
60.45	0.05			15 - 16
70.87	0.01	1.42	0.02	16 - 17

PLAUSIBLE PROFILE–COMPLETE CORE IV: SKINNER LAKE *)				
Age (yrs B.P.)	Sed. Rate (g/cm2.yr)	TP Conc (mg/g dry weight)	TP Acc Rt (mg/cm2.yr)	Core Int. (cm)
0.00	0.23	1.50	0.35	0 - 1
0.81	0.23			1 - 2
2.10	0.22	1.11	0.24	2 - 3
3.92	0.21			3 - 4
5.65	0.35	1.26	0.44	4 - 5
6.55	0.34			5 - 6
7.67	0.33	1.25	0.41	6 - 7
9.01	0.31			7 - 8
10.49	0.37	1.42	0.52	8 - 9
11.81	0.35			9 - 10
13.17	0.34	1.22	0.41	10 - 11
14.57	0.32			11 - 12
16.24	0.35	1.58	0.56	12 - 13
17.96	0.34			13 - 14
19.60	0.32	1.31	0.42	14 - 15
21.15	0.30			15 - 16
22.68	0.10	1.42	0.15	16 - 17
27.03	0.10			17 - 18
30.88	0.09			18 - 19
34.96	0.09			19 - 20
39.28	0.08			20 - 21
43.88	0.08			21 - 22
48.78	0.07			22 - 23
54.01	0.07			23 - 24
59.60	0.06			24 - 25
65.58	0.06			25 - 26
71.98	0.06			26 - 27
78.76	0.05			27 - 28
86.36	0.05			28 - 29
95.01	0.04			29 - 30
105.04	0.04			30 - 31
117.01	0.03			31 - 32
131.90	0.02			32 - 33
151.77	0.02			33 - 34
182.77	0.01			34 - 35
				35 - 36
				36 - 37

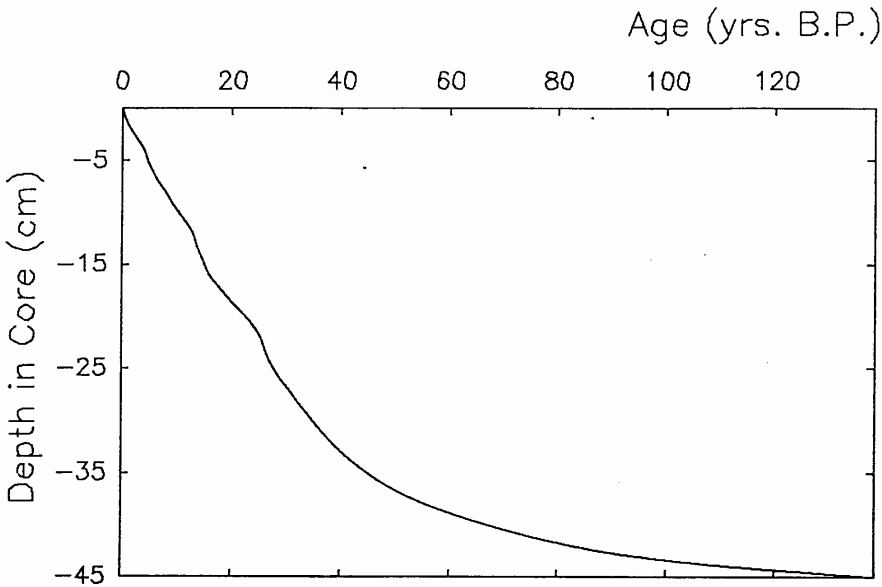
*) See assumptions for this profile in my earlier write-up.

SKINNER: CORE V.

Core Int. (cm)	Bulk Density (g/cm3)	Unsupp. Pb-210 (pCi/g)	Unsupp. Pb-210 (pCi/cm2)	Cum.Res. Unsupp PB-210(pCi/cm2)	Age (yrs B.P.)	Sed. Rate (g/cm2.yr)
0 - 1	0.14	2.45	0.34	17.55	0.00	0.22
1 - 2	0.20	2.45	0.49	17.21	0.64	0.22
2 - 3	0.26	2.45	0.63	16.72	1.56	0.21
3 - 4	0.25	2.45	0.60	16.09	2.79	0.20
4 - 5	0.24	1.36	0.32	15.49	4.02	0.35
5 - 6	0.29	1.36	0.40	15.17	4.69	0.35
6 - 7	0.35	1.36	0.47	14.77	5.54	0.34
7 - 8	0.42	1.36	0.56	14.30	6.58	0.33
8 - 9	0.48	1.00	0.48	13.74	7.87	0.43
9 - 10	0.52	1.00	0.52	13.25	9.03	0.41
10 - 11	0.55	1.00	0.55	12.73	10.31	0.40
11 - 12	0.43	1.00	0.43	12.18	11.73	0.38
12 - 13	0.32	0.70	0.22	11.75	12.89	0.52
13 - 14	0.36	0.70	0.25	11.53	13.50	0.51
14 - 15	0.41	0.70	0.29	11.27	14.22	0.50
15 - 16	0.39	0.70	0.28	10.98	15.05	0.49
16 - 17	0.38	1.25	0.47	10.71	15.87	0.27
17 - 18	0.39	1.25	0.49	10.24	17.32	0.25
18 - 19	0.40	1.25	0.50	9.75	18.88	0.24
19 - 20	0.41	1.25	0.52	9.25	20.57	0.23
20 - 21	0.43	0.98	0.42	8.73	22.42	0.28
21 - 22	0.42	0.70	0.30	8.31	24.00	0.37
22 - 23	0.42	0.43	0.18	8.01	25.18	0.58
23 - 24	0.41	0.43	0.18	7.83	25.91	0.57
24 - 25	0.41	0.57	0.23	7.66	26.64	0.42
25 - 26	0.40	0.72	0.29	7.42	27.63	0.32
26 - 27	0.37	0.86	0.32	7.14	28.89	0.26
27 - 28	0.35	0.86	0.30	6.82	30.37	0.25
28 - 29	0.33	0.91	0.30	6.52	31.82	0.22
29 - 30	0.30	0.97	0.29	6.22	33.32	0.20
30 - 31	0.28	1.02	0.28	5.93	34.85	0.18
31 - 32	0.30	1.02	0.30	5.65	36.42	0.17
32 - 33	0.32	1.02	0.32	5.35	38.18	0.16
33 - 34	0.34	1.01	0.34	5.02	40.17	0.15
34 - 35	0.36	1.01	0.36	4.68	42.42	0.14
35 - 36	0.37	1.01	0.38	4.33	44.97	0.13
36 - 37	0.36	1.14	0.41	3.95	47.91	0.11
37 - 38	0.35	1.26	0.44	3.53	51.46	0.09
38 - 39	0.34	1.39	0.47	3.09	55.77	0.07
39 - 40	0.33	1.39	0.46	2.62	61.10	0.06
40 - 41	0.32	1.31	0.42	2.16	67.27	0.05
41 - 42	0.33	1.24	0.41	1.74	74.19	0.04
42 - 43	0.34	1.17	0.39	1.33	82.74	0.04
43 - 44	0.35	1.17	0.41	0.94	94.00	0.03
44 - 45	0.36	0.81	0.29	0.53	112.19	0.02
45 - 46	0.37	0.46	0.17	0.24	137.60	0.02
46 - 47	0.34	0.11	0.04	0.07	176.65	0.02
47 - 48	0.31	0.11	0.03	0.03	200.34	0.01
48 - 49	0.28					
49 - 50	0.25					
50 - 51	0.23					
51 - 52	0.22					



UNSUPPORTED PB-210 CONCENTRATION - SKINNER CORE V



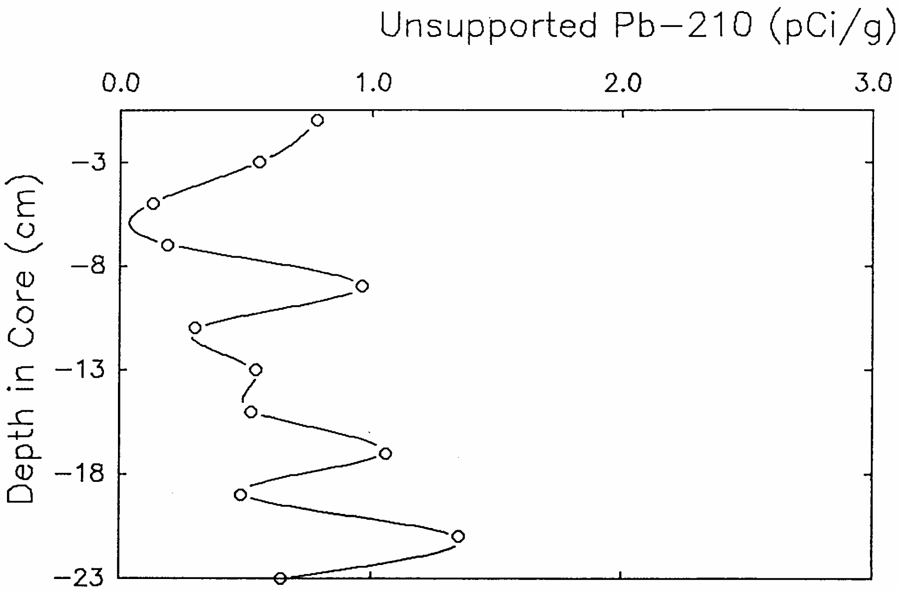
SKINNER CORE V – AGE VS. DEPTH CURVE

SKINNER: CORE V.

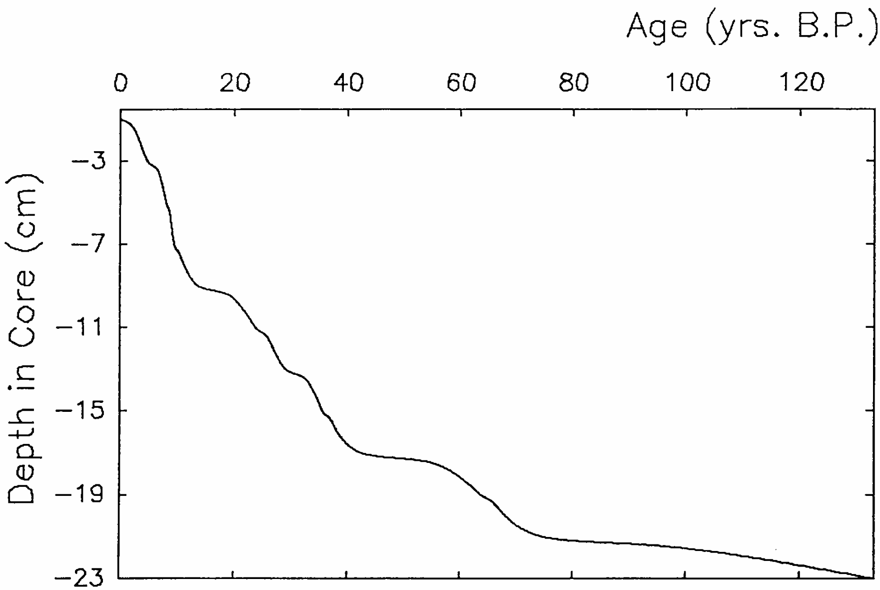
Age (yrs B.P.)	Sed. Rate (g/cm2.yr)	TP Conc (mg/g dry weight)	TP Acc Rt (mg/cm2.yr)	Core Int. (cm)
0.00	0.22	1.10	0.25	0 – 1
0.64	0.22			1 – 2
1.56	0.21	1.20	0.26	2 – 3
2.79	0.20			3 – 4
4.02	0.35	1.12	0.40	4 – 5
4.69	0.35			5 – 6
5.54	0.34	1.56	0.53	6 – 7
6.58	0.33			7 – 8
7.87	0.43	2.12	0.91	8 – 9
9.03	0.41			9 – 10
10.31	0.40	1.51	0.60	10 – 11
11.73	0.38			11 – 12
12.89	0.52	1.08	0.56	12 – 13
13.50	0.51			13 – 14
14.22	0.50	1.42	0.71	14 – 15
15.05	0.49			15 – 16
15.87	0.27	1.97	0.53	16 – 17
17.32	0.25			17 – 18
18.88	0.24	0.65	0.16	18 – 19
20.57	0.23			19 – 20
22.42	0.28	0.53	0.15	20 – 21
24.00	0.37			21 – 22
25.18	0.58			22 – 23
25.91	0.57			23 – 24
26.64	0.42			24 – 25
27.63	0.32	1.05	0.34	25 – 26
28.89	0.26			26 – 27
30.37	0.25			27 – 28
31.82	0.22			28 – 29
33.32	0.20			29 – 30
34.85	0.18	1.70	0.31	30 – 31
36.42	0.17			31 – 32
38.18	0.16			32 – 33
40.17	0.15			33 – 34
42.42	0.14			34 – 35
44.97	0.13	1.02	0.14	35 – 36
47.91	0.11			36 – 37
51.46	0.09			37 – 38
55.77	0.07			38 – 39
61.10	0.06			39 – 40
67.27	0.05	0.99	0.05	40 – 41
74.19	0.04			41 – 42
82.74	0.04			42 – 43
94.00	0.03			43 – 44
112.19	0.02			44 – 45
137.60	0.02	1.10	0.02	45 – 46
176.65	0.02			46 – 47
200.34	0.01			47 – 48
				48 – 49
				49 – 50
		1.24		50 – 51
		0.90		51 – 52

SKINNER: WETLAND CORE.

Core Int. (cm)	Bulk Density (g/cm3)	Unsupp. Pb-210 (pCi/g)	Unsupp. Pb-210 (pCi/cm2)	Cum.Res. Unsupp PB-210(pCi/cm2)	Age (yrs B.P.)	Sed. Rate (g/cm2.yr)
0 - 1	0.98	0.78	0.77	10.19	0.00	0.41
1 - 2	0.96	0.67	0.64	9.42	2.52	0.44
2 - 3	0.94	0.55	0.51	8.78	4.77	0.50
3 - 4	1.05	0.34	0.36	8.27	6.71	0.76
4 - 5	1.16	0.13	0.15	7.91	8.12	1.89
5 - 6	1.18	0.16	0.19	7.76	8.74	1.51
6 - 7	1.19	0.19	0.23	7.57	9.53	1.24
7 - 8	1.17	0.58	0.67	7.34	10.50	0.40
8 - 9	1.15	0.96	1.10	6.67	13.59	0.22
9 - 10	1.12	0.63	0.71	5.57	19.38	0.28
10 - 11	1.09	0.30	0.33	4.86	23.73	0.50
11 - 12	0.97	0.42	0.41	4.54	25.98	0.34
12 - 13	0.84	0.54	0.45	4.13	28.99	0.24
13 - 14	0.59	0.53	0.31	3.68	32.72	0.22
14 - 15	0.33	0.52	0.17	3.37	35.56	0.20
15 - 16	0.59	0.79	0.47	3.19	37.26	0.13
16 - 17	0.85	1.06	0.90	2.72	42.35	0.08
17 - 18	0.54	0.77	0.42	1.82	55.31	0.07
18 - 19	0.23	0.48	0.11	1.40	63.70	0.09
19 - 20	0.31	0.92	0.28	1.29	66.38	0.04
20 - 21	0.39	1.35	0.52	1.00	74.39	0.02
21 - 22	0.32	1.00	0.32	0.48	98.00	0.02
22 - 23	0.25	0.64	0.16	0.16	132.89	0.01



UNSUPPORTED PB−210 CONCENTRATION
WETLAND CORE



SKINNER WETLAND CORE
AGE VS. DEPTH CURVE

SKINNER: WETLAND CORE.				
Age (yrs B.P.)	Sed. Rate (g/cm2.yr)	TP Conc (mg/g dry weight)	TP Acc Rt (mg/cm2.yr)	Core Int. (cm)
0.00	0.41	1.14	0.46	0 - 1
2.52	0.44			1 - 2
4.77	0.50	0.98	0.49	2 - 3
6.71	0.76			3 - 4
8.12	1.89	0.56	1.06	4 - 5
8.74	1.51			5 - 6
9.53	1.24	0.83	1.03	6 - 7
10.50	0.40			7 - 8
13.59	0.22	0.74	0.16	8 - 9
19.38	0.28			9 - 10
23.73	0.50	0.86	0.43	10 - 11
25.98	0.34			11 - 12
28.99	0.24			12 - 13
32.72	0.22			13 - 14
35.56	0.20	0.68	0.14	14 - 15
37.26	0.13			15 - 16
42.35	0.08	0.68	0.05	16 - 17
55.31	0.07			17 - 18
63.70	0.09	0.78	0.07	18 - 19
66.38	0.04			19 - 20
74.39	0.02	0.71	0.02	20 - 21
98.00	0.02			21 - 22
132.89	0.01	0.85	0.01	22 - 23